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# CHIBER. — *SYN.:* PEMPHIGUS (BURKE), SPECIFIC ECZEMA (FRÖHNER U. FRIEDBERGER), "MAUKE" (GERMAN).

BY RICHARD W. BURKE, V.S., A.V.D., STATION CHIEF VETERINARY HOSPITAL, CAWNPORE, INDIA.

THE ancients, as well as many mediæval *hakeems* and *baids* of various denominations in India, attributed this malady to some great perturbation of the system, some general change, whereof "Chiber" is but a local manifestation. The subject has often been handled by veterinary surgeons in India, but nothing definite regarding it has ever been suggested; and such names as Herpes, Mange, Grease, etc., indicate the nature of views held in regard to its pathology.

Many believe that it is entirely a local disease, but some authorities contend that a disease having a tendency to run a chronic course in so many cases, cannot be considered local in character, and must therefore be classed among the general diseases.

My view of the subject is that the variation in the stages of the disease itself, is some excuse for the variety of opinion as to its pathology which obtains in the profession in India.

The disease prevails especially in the rains, and during winter months, when heavy dews fall, which bathe the animal's legs when turned to grass. Pretty extensive inquiries made in various parts of the country have failed to show the existence of the disease during other seasons or in dry weather.

As to the nature of the morbid changes, the most reasonable view seems to be that it is the result of an organic poison, or micro-organism, entering the tissues through chinks in the epidermis, which spends its local action on the neighbouring structures,

without ever producing any constitutional symptoms. As there is nothing else to account for the production of these cases, the condition of the grounds over which the horses have been exercised or let loose seems the most natural source to look to, and, as mentioned above, the dew and moisture about the roots of the grass, perhaps containing the organisms in question, have been shown to produce this disease in many cases, which leaves not the shadow of a doubt as to its mode of origin.

Friedberger has observed that on account of the wet and cold, this disease especially prevails during the winter in Germany. Prietsche* has found that this disease prevails also as a result of sprinkling salt on the tramway lines during winter months, but I am clearly of opinion that this is a form of Eczema distinct from Chiber. Straub† has recorded the occurrence of "traumatic eczema" in these parts liable to Chiber, noticed in army horses which were exercised over recently-cut fields, which resembled more a form of infectious inflammation of the skin than simple Eczema. This form of disease resembled somewhat the ordinary "Mauke" described by the Germans, and was characterised by a great number of small ulcers on the skin, which were followed in aggravated cases by Erysipelas and phlegmonous inflammation of the skin. This infectious dermatitis does not, whether in the German or Indian forms of the disease, occur as a rule, except when the eruptions burst, or cracks occur in the skin from accidental causes, allowing access to septic matters.

Röll,‡ Friedberger u. Fröhner, Anacker, and others describe this disease under the name of "Mauke," which they consider to be a form of *specific eczema*. They notice that the practice of cutting the tuft of hairs from the back of the fetlocks in coarse-bred horses, observed in European countries, especially deprives natural protection of the parts, and frequently leads to this disease.

"The long dewy grass perpetually brushing against the coronets when the horses walk would, of course, wet the front more than the back of the foot, and the evaporation, by producing a reaction, might bring on inflammation of the skin and other symptoms of the disease" (Meyrick).

"The hind feet, being more exposed to the irritating action of damp, filthy standings, are generally more subject to this disease" (Friedberger). Veterinary surgeons in charge of the Central Government Studs in India observed the same fact.

The disease appears chiefly, in India, in horses brought in from damp fields, and their legs allowed to remain wet for long intervals,

* Sächs, Jahresbericht, 1884.
† Repertor, 1853, p. 213.
‡ Speciellen Pathologie u. Therapie fur Thierarzte, 1885.

or imperfectly rubbed dry from neglect or carelessness on the part of syces. Simply rubbing the legs dry does not prevent the disease; they should be thoroughly washed before rubbing them dry with a cloth. Washing in stagnant rain water, obtained from ditches along road sides, also produces this disease.

*Etiology.*—The disease may be defined as a special form of Neurosis* of the blood-vessels of the skin, attended by loss of tone and more or less inflammatory disturbance, followed by exudation of serum, which infiltrates the structures of the skin, and raises the epidermis in blisters. The blisters contain at first simple serum, which later on becomes purulent or sero-purulent in character, containing pus cells, probably due to migration of white blood-cells and proliferation of the rete. Bacteria sometimes, though not constantly, appear in the contents of the vesicles. The blisters finally burst, and a watery-yellow, at first odourless liquid, finally becoming purulent or sero-purulent in character, flows (*stadium madidans*). The swollen skin, by the movement of its thick folds from effusion, cracks during the animal's progression, and contractions set in. The cracks in many cases take on inflammatory action, and in a short time again become covered by a scab, causing a matting together of the hairs and depilation. In some cases a peculiar fluid oozes from the affected skin, drying up into thin varnish-like crusts. The surface becomes, after a time, covered with hairless skin, so hard and dense that it resembles frog-horn (*Pemphigus folicacens*). The disease then assumes an entirely new aspect.

"During its later stages," says Professor Friedberger, "a peculiar running from the surface of the skin may be noticed, which bathes the epidermis. As a consequence of this, we find a colourless, adhesive substance, accompanied by fœtor, completely covering the affected skin, and which, finding access through the cracks, causes chronic thickening of the skin."—(*Lehrbuch der Speciellen Pathologie und Therapie der Hausthiere*, 1886.)

*Varieties.*—It is not necessary to recognise more than two forms, acute and chronic Chiber; whilst a multitude of other names, from their pretty constant appearance, may be mentioned as sub-varieties of one and the same affection. The acute form is associated with an outbreak of larger or smaller vesicles, which die away without giving rise to any other changes of the skin or subcutaneous tissues to be met with in the chronic variety (pompholyx), in which the process gradually extends until the greater part or whole of the skin and subcutaneous tissues becomes implicated. Cracks then appear on the surface, the hair falls off, and a nauseous odour exhales from the affected skin. The vesicles appear in successive

* Heath's "Dictionary of Surgery," art. Pemphigus.

crops, and horses that have once suffered are not exempt from it afterwards. Professor Friedberger says in rare instances the affected skin has been seen in time to assume the characters of Elephantiasis, but this is only seen in bad or protracted cases, and is not characteristic of the disease itself.

The acute variety (*Pemphigus acutus*) and the chronic (*Pemphigus vulgaris*) are the most common forms assumed by both Chiber and its German type, "Mauke."

Itching is very marked in many cases, which is evidenced by the horse stamping his feet and rubbing them against each other, the animal frequently breaking the vesicles with his teeth, as well as by friction of the opposite leg, as soon as they are formed (*Pemphigus pruriginosus*). Hence the vesicles are not often seen which have formed and recently broken; the epithelium is found ruptured and gathered into folds. In the pruriginous form the vesicles are smaller than in the other varieties. Some authors on human medicine describe this type under the head of "pemphigoid."*

Attempts made to communicate Chiber from one horse to another, by inserting the contents of the blisters under the skin of the coronet and pastern, have failed to produce any results, save a soreness of the skin, which passes off in a couple of days. The disease is, therefore, not contagious.

*Treatment.*—The treatment will vary according to the stage of the disease. In the beginning cleanliness and dryness, combined with dressings of oxide of zinc powder or of zinc ointment, will suffice to effect a cure. In more advanced stages of the disease, more energetic means will be necessary, principally astringents and caustics, to cause it to subside; alum, borax, catechu, charcoal, nitrate of silver, etc., are the agents most commonly employed, and are generally attended by good results. Iodoform has been recommended by many German veterinary surgeons, but when once induration and hypertrophy have set in, no treatment is generally of any avail.

In Quain's "Dictionary of Medicine" Hutchinson† is quoted, who thinks arsenic is the only remedy of *certain* value in bad cases of Pemphigus in the human subject. Mr. Meyrick, in his *Stable Management and the Prevention of Disease among Horses in India*, says, "The internal administration of arsenic in fine-grain doses for about a fortnight, seems to assist the cure in bad or protracted cases of Chiber." The natives of India have employed arsenic in the treatment of Chiber from the earliest times, and they believe it

* "Skin Diseases," by Dr. T. Fox. 3rd ed., p. 220, 221.

† See a detailed examination of the facts in Hutchinson's "Clinical Lectures," vol. i., 1879, pp. 49-74.

is a specific for some forms of this disease. Perhaps arsenic in large doses does good by acting as a diuretic, which relieves hyperæmia of the skin. The *foliaceous* variety is best treated with repeated blisters of hydrarg. rubrum.

*Diagnosis.*—The only diseases with which Chiber is at all likely to be confounded are Herpes and Variola, both of which always run a more rapid course than it, and are therefore quite distinct. We have no such thing as protracted vesicular eruptions in Herpes and Variola, which diseases having once appeared do not show themselves again, or persist like Chiber does. In the acute form of Chiber the vesicles burst almost as soon as they are formed, so that they often escape detection; in Herpes the vesicles do not rupture as a rule, but their contents, after becoming opaque, disappear by *resorption*,* and only rarely by rupture and desiccation into light brownish scabs. In the majority of cases the vesicles in Herpes last about eight days; in Chiber they burst as a rule as soon as they are formed, or very soon afterwards, and frequently escape detection.

Contagious Impetigo in the horse, observed by Schindelka and myself, is characterised by special features, and could hardly be mistaken for Chiber. The disease is, moreover, contagious, and Chiber is not.

Unlike the above diseases, Chiber does not manifest any tendency to spontaneous recovery without treatment. Chiber is distinguished by its persistency, the indolence of its course, and tendency to recurrence after it has once apparently been cured, the cracks and ulcerations left, and the other concomitants which are never met with in the diseases mentioned above.

From Eczema the history usually distinguishes it, the lesions getting no better for many weeks; Eczema, on the contrary, is either cured or spreads very quickly. Some veterinarians who have witnessed this disease in its acute form only, deny this, and consider Chiber terminates with the rupture of the vesicles, whilst they attribute the chronic changes to neglect of treatment. It is, under any circumstances, a most important subject for inquiry.

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## REMOVAL OF THE EYEBALL.

BY JOHN FREEMAN, M.R.C.V.S., HULL.

It is seldom, in the ordinary routine of practice, that the eye is met with in such a diseased condition as to necessitate its removal, and the infrequent occurrence of which operation prompts me now to

* "Skin Diseases," by Dr. Tilbury Fox. 3rd ed., art. Herpes.

place the following case on record; not so much, with any idea of specially detailing its performance, as to point out how, when judiciously resorted to, the same may be the means of materially alleviating an animal's suffering, and prolonging the life and service of a very useful creature. The subject in question was an aged cart-mare, the property of a small farmer in North Lincolnshire, which had been affected with disease of the eye for more than two years. On first seeing her on June 15th last, I found the organ considerably tumefied and apparently starting from its socket; the cornea was much hypertrophied and protruded a good distance beyond the substance of the eye, being very inflamed and raw, centrally covered by a scab, whilst its circumferent portion was opaque and reddened by vascularity. The eyelids were inflamed and so swollen at their margins as to be partially everted; this was particularly marked at the inner canthus. There was also a discharge of whitish mucus. I gathered from the owner that the eye became gradually diseased, though no cause, as an injury or an attack of ophthalmia, could be assigned as originally productive of such a condition, and two or three practitioners had seen the case at various times, and to an extent treated it—with no success. The mare had a foal at foot which she suckled very badly; she was herself in an exceedingly poor state, and was said to have been wasting daily for some time: she had but little appetite in the stable, and when turned out in the field did not care to put her head down to feed: the expression of her countenance was indicative of pain, and which she readily manifested when the diseased organ was manipulated. I saw no way by which alleviation could be attained save by complete removal of the eyeball, and accordingly on June 24th, assisted by Mr. Frank Smith, M.R.C.V.S. (who was staying with me at the time, and to whose aid I am much indebted), I had the mare cast, put under the influence of chloroform, and proceeded to operate. The eye by this time had become considerably more swollen, raw, and angry-looking, and apparently more resembled a huge fleshy growth from the palpebral fissure than anything else. From either canthus I firstly enlarged the fissure and stitched the eyelids back, and then divided the conjunctival membrane at its reflection on to the sclerotic coat, cut through the fibrous loop of the superior oblique muscle, and passing the scalpel quite to the back part of the orbital cavity I completely incised the muscles, blood-vessels, and nerves, and removed the eyeball intact. There was but little bleeding till the division of the art. centralis retina, when immediately a stream followed, nearly half the size of one's little finger, and in course of an exceedingly short period of time the mare had lost a quart or more of blood. I could not get at the artery to take it up, but had

a plentiful supply of cold water thrown on immediately, and Mr. Smith, approximating the eyelids, I stitched them so tightly and closely that scarcely any blood could escape from the orbital cavity, though it speedily filled, and, distending the eyelids, produced a large bulging swelling. I then let the mare get up, and had cold water played on the part for some hours, ordered her to be kept quiet and well nursed. On July 2nd the swelling was lessened, doubtless owing to contraction of the clotted blood in its interior; the margins of both eyelids from the pressure of the sutures were sloughing away, leaving the eyelids themselves glued together, and every aspect of their so healing, with the exception of just at the inner canthus, where there was a slight discharge. Removed sloughing portions, left carbolised oil for healing parts, and ordered the mare plenty of nutritious diet with confinement to her box. July 20th: Swelling more reduced, and union of eyelids becoming more complete; mare feeding well; continue dressing, and turn mare out to grass for a little while, night and morning; still some discharge from inner canthus. July 28: Mare had gained flesh since last visit and suckling foal much better, swelling still more reduced, and healing of eyelids complete; said she might go to light work if wanted. August 13th: All enlargement had now disappeared, and the eyelids, instead of bulging out, were sunk in and wrinkled, with a mere thin line of scar at the point of junction, and slight gumminess at inner canthus. The mare had been working every day since my last visit, and was getting fat, though living now entirely on grass; the foal, too, was thriving excellently, and it was the owner's opinion that the mare, having been put to the horse, was pregnant again.

I now much regret I did not at the time make a more minute examination of the removed eyeball. A cursory glance showed it to be assuming a flesh-like nature in place of the usual structure, and evidently it was taking on a malignant form of disease, whether as a primary circumstance, or secondary to an injury, not knowing sufficient of the previous progress of the case, it is impossible to say. A hypertrophied condition of the art. centralis retina accounted for such excessive hæmorrhage following its division, and, without doubt, the clotted blood which was confined in the orbital cavity by the suturing of the eyelids gradually became absorbed, as at no time in the small discharge exuding from the inner canthus was there any fœtor. That the diseased condition of the eye was a source of considerable pain and irritation to the animal prior to its removal, from her very appearance seemed self-evident, and the relief she must have experienced in consequence of my procedure was testified by a most marked and speedy improvement in her condition, and which I have every reason to

believe is still maintained. It is worthy of mention that the remaining eye is quite sound.

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## A CASE OF PANNUS IN THE HORSE'S EYE.

BY H. F. JAMES, V.S. (GRADUATE OF ONTARIO VETERINARY COLLEGE), ST. LOUIS, U.S.A.

PANNUS, according to Soelberg Wells, in his work on "Diseases of the Eye," is characterised by a superficial vascular opacity of the cornea, occupying more or less of its expanse. It is due to the formation of a layer of cells, having a strong tendency to become developed into connective tissue. This disease has not, to my knowledge, been mentioned as occurring in our patients, though I have met with it in one horse and a number of dogs, especially greyhounds. The case I bring before your notice this evening was in a heavy draft-horse, and the owner directed my attention to it as moonblindness, which is a very prevalent trouble in the west. The yellowish white opacity, streaked with blood, was quite different from any appearance presented during the course of periodic ophthalmia, and I soon saw that it was the same trouble that I had met with in dogs. Oculists look on this disease as not very amenable to treatment, even with strong astringent and stimulating collyria. They advise, in bad cases, inoculation of matter, even that of gonorrhœal ophthalmia is said not to be too virulent, for the purpose of exciting a vigorous inflammatory action in the eye. This is a dangerous procedure in a healthy eye, but the vascularity of a pannus generally preserves from ulceration, perforation, and the sequelæ which might follow such an inoculation in a normal cornea. Having a well-marked case of "pink-eye" in the same stable, I took some of the muco-purulent discharge from the eyes, and placed between the lids of the pannus case a few times with a camel's-hair brush. Twenty-four hours after, a little redness of the eye, and some weeping; forty-eight hours and lids greatly swollen, intolerance of light, and muco-purulent discharge. The inflammation ran very high for nearly two weeks. I then began to use a six-grain solution nitrate of silver, and kept it up for three weeks, the result being that the eye has cleared up splendidly, and only a slight trace of the former opacity remains.

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## ON THE DIFFERENT MODES OF TREATMENT OF ENTROPIUM.

BY MAX KETTRITZ, VETERINARY SURGEON, GNESEN, GERMANY.

CONSIDERING the different methods of operation for entropium, which have not only been advised, but also performed, observation and experience gives preference to that method in which a small flap of skin is excised from the upper lid. If the edges of the wound are brought into apposition, and held together by sutures, the lid becomes shortened and an artificial eversion of it takes place. The other methods do not answer the same purpose. Nevertheless, I may be allowed to make some remarks with regard to these unusual methods, as they are mentioned in the literature of veterinary surgery, and some of them I have performed myself. According to Helling, a caustic and astringent (sulphuric acid) is good in mild cases of relaxation of the eyelid, but is often uncertain in its results. The method of incising the conjunctiva when the entropium is due to contraction of it (conjunctiva) is rarely successful, owing to the cicatrization which follows the incision. Division of the tarsus, where shortening of the same causes the entropium, is also doubtful, because the tarsus usually becomes shortened again, and afterwards the border of the eyelid often assumes a worse position than before. Complete removal of the tarsus causes a severe injury and mutilation; excision of a piece of the upper eyelid, and healing by first intention, produces shortening of the wound and eversion of the eyelid. Besides this, the operation is performed very close to the border of the eyelid, and only a small portion is taken away; and as the cicatrizing wound is parallel with the border of the eyelids, it happens very often, especially in old dogs with flabby eyelids, that the lid extends by relaxation of the tissues, and again turns inwards. The celebrated French oculist, Jobert de Lamballes, recommended, in his human ophthalmology for the removal of entropium, the acupuncture of both eyelids upon their whole surface behind the free borders, according to Delpech's method. Lamballes says that the iron, after being brought to a white heat, must be passed 1m. above and below the free border of both eyelids, so that it will only act upon the thin external covering of the lid.

I myself have tried this method upon a hunting dog of an officer of the artillery. In consequence of the cauterisation, the eyelid was turned outward at once, but this was only for a short time; on account of the slight swelling and the œdema of the lids, which followed afterwards, the entropium formed itself again, and was not reduced till suppuration and cicatrization had taken place. In

order to moderate the inflammation and to lessen the pain, I covered the lids with compresses dipped in cold water.

The operation was followed by a very disagreeable granular keratitis. While cauterizing I came too near to the cornea, because the patient was very restless and would not close the lids. The treatment of the entropium lasted a fortnight, and unfortunately there remained a very visible scar as a consequence of the influence of the cautery.

Another method of operation for entropium, which I have performed in one case with good success, seems to obviate most of these drawbacks. At first a transverse incision is made through the skin 5m. above the margin of the orbit, about half-an-inch long. Then two converging incisions are directed towards the border of the eyelid, so as to form a triangle whose apex sides are 1½m.-2m. away from the eyelid border, and which have here a distance of 3m. between each other. After this the flap is dissected and the eyelid drawn up to its natural position, the flap being shortened as much as the case requires. With two sutures the flap is fastened to the base of the triangle, and is otherwise secured with strips of adhesive plaster. Where it seems necessary, the lateral incisions may be secured with sutures to the adjacent parts. It need hardly be mentioned that some hairs of the eyebrows must be cut away before operating. The shortened flap of skin heals readily, as a rule, and the purpose of the operation to lessen the size of the external eyelid is easily accomplished. This method of operation has, in my opinion, the essential advantage over the usual excision of a transverse fold of the lid and its healing; for in the way described above, there is a larger flap of skin, which in the process of healing turns the inverted lid outwards, and relaxation can hardly if ever at all return—at least I have not observed it in my patient. The upper and lower osseous border of the orbit serves as a point of fixation and support for the new flap, acting as a pulley to prevent too much relaxation. The disfiguration, caused by the new flap, is of no importance, as it (the flap) unites with the parts on both sides, which contribute to its support and does away with one scar. There is no doubt that this method can be applied to partial entropions, and the flap is then made according to the position and peculiarity of the affection. In some cases of Blepharoptosis and Trichiasis, this operation can also be applied, although these eye diseases are very seldom seen in our domesticated animals. My patient, on whom I have performed this method with good results, suffered from *Phthisis bulbi*, and the contracted tarsus of the inferior lid was considerably turned inwards. The flap healed very nicely, and everything did well; so that after two years no trace of the old trouble could be seen.

My own impression is that this method of treatment of the entropium is likely to be of use in suitable cases, uncomplicated by other eye diseases. I therefore think it desirable that it should be tested by others.

I hope the readers of the VETERINARY JOURNAL will give it a trial and publish the result.

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## HYDROTHORAX: PARACENTESIS THORACIS FOUR TIMES.—RECOVERY.

BY J. C. BERNE, M.R.C.V.S., ARMY VETERINARY DEPARTMENT, ALDERSHOT.

THE above heading is an epitome of a case which I had under treatment during the past summer. It presented, however, features of so interesting a character, both in its course and in its treatment, that I think it desirable to supplement the information which its appended thermometric chart affords.

On June 14, the horse whose case I am describing was reported as not having eaten his evening feed. In addition to the symptoms given in the chart, there was an occasional cough, injection of the conjunctival and nasal mucous membranes, hot skin, and drooping head. He was removed to a large and well-ventilated loose-box, and a bucket of drinking-water, in which Pot. nit. ʒi. was dissolved, placed within his reach. He could also indulge in linseed gruel if so inclined, and small portions of fresh grass were also got for him.

There was no change next day, but on the 16th he was more inclined to eat the grass. The cough was more troublesome on the 18th, and the surface temperature was higher. The treatment adopted, in addition to what has been indicated, was Ext. belladonna ʒi., mixed with treacle, divided into two parts, each portion to be placed on the tongue at half an hour's interval, same to be repeated in the evening; body, face, and nostrils to be sponged with vinegar and water. To avoid repetition, I mention here that this sponging was done several times daily till convalescence set in. On the 21st, though patient *appeared* better, his symptoms pointed the other way. He would not look at food of any sort, and there were evidences of thoracic effusion. Ammon. carb. ʒi. in small ball, three times a day, ordered.

He was still losing ground on the 22nd. The next day the effusion was greater. Two quarts of strong ale ordered to be given daily. The 24th found patient with a very marked loss of stamina, and this was synchronous with increased chest exudation, manifested by the flapping nostrils and wholly abdominal breathing. The right lung's functions had almost ceased. At noon I deter-

mined on operating on this side, and Vet. Surg. Fred Smith, of the Aldershot School, who was present, punctured the chest-wall between the sixth and seventh ribs, about 2½ inches above the junction of ribs and cartilage. Four gallons of fluid were drawn off. No precautions were adopted with reference to the operation. The patient bore it well, and its effects were immediate and satisfactory. Next day the improvement was maintained, but I saw that the condition of the left side demanded attention, as it was half full of fluid. I punctured, using a trocar and canula smaller than that of Mr. Smith.* I took away three gallons of the contents, and with a result equally satisfactory as on yesterday. When the patient's head was released, he turned to the manger and ate a bran-mash. Ale continued as before, with Pot. iod. ʒii. thrice a day, the carbonate of ammonia discontinued; horse eating plentifully of green grass.

On the 28th the breathing much distressed, and patient very low. The loss of flesh at this date was excessive. At 11 a.m. I removed again two gallons of exudate from left side. Patient doing well up to July 4th, when I took away two gallons from right side of chest. From this date till patient was discharged the sick-list, on July 20th, he improved daily.

The first really cheering symptom he showed was on July 10th, when he lay down. He became quite a pet with his attendants in the infirmary, and it was owing to the mistaken kindness of one of these that I attributed a slight attack of Colic he had on the 17th. His appetite at this time was ravenous, and he got too much to eat.

The recovery of this horse after eleven gallons of fluid were removed from his chest by four tappings makes the case *sui generis.*

We are told that different animals and different breeds of horses endure disease very variously. Some die from causes that others live through; and that a thoroughbred horse will withstand disease, and be as serviceable as before, when a lower-bred animal would quickly succumb. As far as breeding goes, the horse (the subject of this report) had nothing to help him—rather the contrary. He is a washy bay, common-bred English animal, 6 yrs. old, standing 15.3½.

To what, then, are we to ascribe the satisfactory ending of this serious attack of illness? Not, in my opinion, to the medicine used; rather to good nursing, attending to hygienic requirements, to a plentiful supply of grass, besides, of course, the tapping. The mildness of the season, no doubt, was also an important factor; for, besides its genial effects, it enabled me to obtain the grass I wanted.

*The canula is $\frac{5}{12}$ of an inch in diameter.

I have stated that I place little to the credit of the medicines used in this case. Indeed, I believe, where a horse is suffering from a wasting disease, drugs might be discarded for good nursing. And it is perfectly clear to my mind that when the dosing of an animal can be accomplished only by force, we occasion worry and pain, and thereby lessen the vital powers which it is our aim to conserve.

Most of us have had to regret the uselessness of paracentesis in many cases of thoracic effusion. I hope the happy result obtained in my case may give us hope in future, and serve to rescue from almost universal condemnation an operation which I have shown to be of real practical utility.

The chest sounds during the disease were of a most puzzling nature. On auscultating the chest since recovery, I find the lungs clear and sounds normal; but there is a little dulness on the left side from a thickened pleura. The horse has been at his duty now over ten weeks, and has never worked or looked better.

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## AN INTERESTING CASE OF FRACTURES.

BY S. ASSHETON SMITH, M.R.C.V.S., CALCUTTA.

I BEG to forward the following short report of a case, which may prove interesting to the readers of the VETERINARY JOURNAL.

The subject was a chestnut thoroughbred entire horse, bred by General Parrot, by "Melton Mowbray," out of an English mare, and foaled in this country; at the time of the accident recorded below he was aged (nine or ten years old).

For the last eighteen months the animal had been suffering from chronic rheumatism, sometimes going sound, and at others excessively lame. On 20th September last he was very well apparently, and the owner, unadvisedly, sent him out for a gallop, presumably having lost patience at the animal's protracted illness. The animal was put into a canter, which was then increased to his best speed, but before he had gone a hundred yards at the latter pace, he fell down in a perfect heap, and was unable to rise.

I was then called to see him, and found that he had sustained a comminuted fracture of the right scapula, a complete oblique fracture of the left metacarpal bone, and fracture of the neck of the ilium, left side. I had him destroyed, and have the bones in my possession.

The ground he was ridden over is perfectly level short turf, first-rate "going" for a horse. The jockey (who had a narrow escape) informs me that when "going" at top speed he heard or felt something snap behind the sadddle, and the animal commenced to sprawl and flounder; he endeavoured to steady the horse by reining up, and then heard the "cannon-bone" give way; they then fell together, and the force of the fall must have fractured the scapula.

# Editorial.

## INSPECTION OF DAIRIES.

QUITE recently a circular-letter has been issued by the Local Government Board, directing the attention of Local Authorities under its control to Section 9 of the Contagious Diseases (Animals) Act, 1886, under which the powers relating to the regulation of dairies, cowsheds, and milk-shops are transferred from the sphere of operations of the Privy Council and Police, to Local Boards of Health and Urban and Rural Sanitary Authorities in their several districts. In this circular it is stated that, by the Contagious Diseases (Animals) Act of 1878, the Privy Council was vested with powers to make orders: (1) For the registration with the Local Authorities of all persons carrying on the trade of cow-keepers, dairymen, or purveyors of milk; (2) For the inspection of cattle in dairies, and for prescribing and regulating the lighting, ventilation, cleansing, drainage, and water-supply of dairies and cowsheds in the occupation of persons following the trade of cow-keepers or dairymen; (3) For securing the cleanliness of milkstores, milkshops, and of vessels used for containing milk for sale by such persons; (4) For prescribing precautions to be taken for protecting milk against infection or contamination.

As these regulations may now be carried into effect by Urban or Rural Sanitary Authorities, we think the attention of the veterinary profession should be kept upon that section (2) of the Act, which deals with the sanitary condition of dairies and the healthfulness of the animals therein; as there is every probability that the object of the section may be frustrated by the manner in which the authorities carry out the necessary measures, and the public thereby deprived of the benefits to be obtainable from their being properly enforced. It is possible, nay, very probable, that incompetent persons may be appointed as inspectors of dairies, and that we shall find medical men, policemen, active or superannuated cobblers, butchers, and others equally unfit, employed on duties which require special technical knowledge, such as only well-skilled veterinarians possess. It is the duty of the profession to protest against any abuse of this kind, and to maintain its right to be consulted and its services enlisted in such work as this. When we consider the immense importance of preserving the milk-yielding inmates of cowsheds in the most perfect state of health possible, and that only special training and long experience among cattle can ensure this, and enable persons to detect disease in its more occult, yet none the less dangerous forms, the necessity for this attitude of observation and expectancy cannot be over-rated. We know how Local Authorities have been, and are now, disposed to ignore the value of veterinary knowledge in the suppression of contagious diseases among animals, and, in order to save a few pounds, as they imagine, they install perfectly incompetent officials in posts in which they do more harm than good. This injudicious thrift has cost the country dearly in money, and a like policy will, if it does not endanger the public health, at any rate do little towards ensuring its protection.

## PASTEUR AND HIS WORK, FROM AN AGRICULTURAL AND VETERINARY POINT OF VIEW.

BY GEORGE FLEMING, LL.D., F.R.C.V.S., PRINCIPAL VETERINARY SURGEON OF THE ARMY.

(*Continued from page* 336.)

The announcement of a method of protection from the most serious animal disease in France, was made on February 28th, 1881, to the Academy of Sciences, where it was received with great acclamation, and immediately afterwards the President of the Society of Agriculture of Melun, on behalf of the Society, invited Pasteur to give a public demonstration of his method of conferring immunity from splenic fever; this invitation he accepted, and sixty sheep were placed at his disposal. It was arranged that ten of these were to be left untouched; twenty-five were to receive an inoculation of very attenuated virus, and in twelve to fifteen days another inoculation of stronger cultivated virus. Some days afterwards these twenty-five sheep, with the other twenty-five which had not been protected, were to be inoculated with the crude mortiferous virus of anthrax.

Ten cows were also given for experiment—six to be inoculated, four not; the ten were afterwards, the same day as the fifty sheep, to be inoculated with uncultivated virus. Pasteur prognosticated that the twenty-five sheep which had not been inoculated would die, and the other twenty-five, protected ones, would survive; also, that the six inoculated cows would resist the poison, while the four which had not been inoculated, even if they did not die, would at least be extremely ill. This prediction startled many of his colleagues at the Academy of Sciences, and some of them designated it a scientific imprudence, which his laboratory experiments scarcely warranted. Pasteur, however, had perfect confidence in the result, as had also his friend and warm admirer, M. Bouley.

On May the 5th the experiment was commenced on a farm belonging to a veterinary surgeon, M. Rossignol, who was Secretary-General of the Melun Agricultural Society. At the desire of the Society a goat was substituted for one of the twenty-five sheep of the first lot. Twenty-four sheep, the goat, and six cows were each inoculated with five drops of cultivated virus, this being placed beneath the skin by means of a hypodermic syringe. Twelve days afterwards, these animals were reinoculated with a stronger cultivated virus; and on May the 31st, all of the cattle and sheep were inoculated with very virulent uncultivated virus. A great number of veterinary surgeons, as well as medical and scientific men, were present, and one of the former, in order to render the trial more comparative, had an animal which had been inoculated with the cultivated virus, operated upon with the deadly material alternately with one which had not been protected. Pasteur then arranged a meeting for June the 2nd, which allowed an interval of forty-eight hours after the test inoculation. On that day more than two hundred persons—prefects, senators, counsellors, doctors, veterinary surgeons, and farmers—assembled at Melun, and it is reported that they could not repress a shout of admiration. Of the twenty-five sheep which had not been protectively inoculated, twenty-one were dead, two were dying, and the others were certain to die that evening; the goat also was dead. The non-protected cows were all suffering from intense fever, and were so weak that they could not eat, while there were great swellings where they had been inoculated with the crude virus. The protected sheep were healthy and lively, while the cows did not exhibit the slightest disturbance in health, and there was no tumour at the seat of inoculation. The most incredulous were convinced

of the value and reality of the experiment, and were unable to conceal their astonishment at the victory Pasteur had gained over such a deadly disease. A veterinary surgeon who had been the most sceptical, now became such a convert that he had himself inoculated with the two cultivations, without any other accident than a slight fever; and it required all the efforts of his family to induce him to desist from inoculating himself with the unattenuated virus.

On the result of this experiment being made known through the medium of the public press, Pasteur was overwhelmed with applications for inoculating material, or "vaccine," from breeders of sheep and cattle, as well as from Agricultural Societies; so that he was compelled to institute a small manufactory in the Rue Vauquelin, Paris, for its preparation. At the end of 1881, 33,946 animals had been protectively inoculated, of which 32,550 were sheep, 1,254 oxen, and 142 horses; in 1882 the number amounted to 399,102, which included 47,000 oxen, and 2,000 horses; and in 1883, 100,000 animals were added to the total of the previous year. In the flocks where half had been protected and the other half had not—all herding together—the deaths from anthrax in 1881 were ten times less among the former than among the latter, being 1 in 740, against 1 in 78; in cows and oxen it was 14 times less, being one in 1,254 against 1 in 88. In 1883 it was proved that the protection conferred by the inoculation of cultivated virus generally lasted longer than a year; but it has been found prudent to recommend inoculation every year, performing the operation at a period before anthrax is usually developed—in March and April; for it is recognised that such inoculation is powerless against the disease in a state of incubation—this is, when the poison is developing in the system.

If we consider that France was estimated to lose, annually, from this disease alone, animals valued at twenty millions of francs (£800,000), we need not wonder at the anxiety of agriculturists to avail themselves of any measure which offered a prospect of diminishing such a serious drain upon their resources—not to mention the risk they and their labourers incurred from such a dangerous contagion, as well as the trouble of burial of carcases, and other disadvantages which cannot be directly estimated.

A few words may now be employed in describing, in outline, the method of enfeebling or attenuating the virus of this and some other virulent diseases, in order to procure protective material, or "vaccines," for inoculation, as well as in sketching the manner of performing inoculation.

The crude virus of the disease is first sown, in minute quantity, in what is termed cultivation liquid. But in order to exclude all other germs, except those which are to be cultivated, the greatest care is necessary in order to completely "sterilise" this liquid, previous to the sowing; and everything relating to the operation—cotton-wool, filters, culture-tubes, flasks, and all implements—has to be rendered thoroughly free from germs, or sterile, by exposure to a high temperature, such as will certainly destroy all organisms (298° to 334° Fahr.). The seed-bed, or cultivation liquid itself, which is some simple infusion or decoction of suitable organic matter, is boiled for an hour at a time on two consecutive days, in glass vessels with a narrow neck, which is then plugged with baked cotton-wool; this wool intercepts the entrance of germs by filtering the air, while allowing the latter to pass through. And to make certain that all spores which may have been in the fluid at the first boiling are killed, it is maintained at a temperature varying between 89° and 90° Fahr., which will induce any that may have escaped to advance to that stage of germination at which destruction would be certain at the second boiling. After this it is kept for some weeks again at the medium temperature, still secluded by the cotton-wool; if it remains clear and limpid for that time, it is fit for sowing, but if it becomes turbid, it shows that it has been imperfectly sterilised, and is unfit for use. If every

precaution has been taken, the fluid will remain perfectly limpid for months, though the cultivation-tubes which contain it are only closed by some loose cotton-wool. Instead of cotton-wool, the tube is sometimes closed by softening its neck by the blow-pipe, and drawing it out to a very small extremity, at the same time bending it to and fro in a number of sinuous twists. At each of these bends a little liquor condenses, which detains any impurities that might be carried in by the air. When the cultivation fluid has been inoculated with the virus, the same care is exercised in excluding these impurities, and it is kept at the temperature most favourable for the growth of the germs, which soon multiply so rapidly as to make it quite opaque in a short time.

With regard to the inoculation of animals, the prepared fluid is contained in closely corked tubes, those of Pasteur holding sufficient to inoculate 50 100, 200, or 300 sheep; and they are labelled as "first vaccine," or "second vaccine," according to the degree of cultivation. Of course, it is most important that the liquid should be perfectly pure when it is used, as if not, inflammation of the skin, blood-poisoning, &c., might occur, and the object of the inoculation be frustrated. The tubes should be kept in a cool place, as in a cellar, and a tube which is opened one day should not be kept for use afterwards, but if any of the contents is left, it should be destroyed. Inoculation is made with the ordinary hypodermic or Pravaz syringe, such as is used by medical men and veterinary surgeons. This instrument should be perfectly clean and free from germs every time it is used, and in filling it, care must be taken that air is not sucked in with the fluid to be injected. The piston should work so well as to completely fill the syringe. If sheep are to be inoculated, an assistant seizes the animal, seating it on the ground and holding it by the fore legs, while the operator inserts the needle of the syringe through the thin skin inside the thigh. When completely through the skin, the piston is pushed until sufficient fluid has been introduced—the body or piston of the syringe being graduated by marks, the quantity can be measured. The needle is then withdrawn and the skin lightly rubbed, in order to diffuse the injected material beneath it. The syringe will hold fluid sufficient to inoculate eight sheep or goats, or four horses or cows; and with a little practice a man can operate on 150 sheep per hour. In twelve or fourteen days after the first inoculation, the operation is repeated with the second or stronger fluid, the opposite thigh being selected if sheep are the subjects. With the larger animals, the inoculation is made behind the shoulder in cows and oxen, and in the neck of horses. The skin being thick, care should be taken not to bruise it in pushing the needle through. This is best done by taking up a fold of the skin and passing the needle into it, the needle being stronger than that for sheep. If the first inoculation is not properly done, there is danger that the second may kill. The appearance of a tumour at the point of inoculation in cows has been rare, but in horses, and more especially young horses, this has been noticed; but it has generally subsided without any treatment.

The experiment of inoculating young horses three times—twice with the first vaccine, and once with the second—has resulted favourably, no tumour appearing. This may prove to be the best method of inoculation for horses.

It may be interesting here to remark that, whether moved thereto by Pasteur's success in protecting poultry from fowl-cholera, or inspired by some other influence, there were other investigators of this disease in the field, who came near the goal which was subsequently reached by the indefatigable master. In 1880, Dr. Toussaint, of the Toulouse Veterinary School, published the results of his inquiries and experiments, and we learn that for nearly four years he had been almost exclusively occupied with the study of anthrax, and especially practising experimental inoculation of its

virus. These experiments led him to the discovery of that sheep and rabbits were protected by injecting beneath the skin anthrax blood deprived, he believed, of the bacilli, either by filtration, heat, or even antiseptics. He preferred heating fresh blood from a diseased animal to a temperature of 131° Fahr. for ten minutes, adding to it one-half per cent. of carbolic acid. A small quantity of this injected beneath the skin, gave rise to slight fever in three or four days, but which subsided on the fifth day. Inoculation with very virulent anthrax blood on the fifteenth day afterwards, produced no effect; so that the animal was proof against it. When injected at the same time as the heated material, however, death ensued.

Toussaint had, therefore, the priority of two years in discovering a means of securing immunity from anthrax, in modifying its virus by heat; but, unfortunately, his simple method has not been found to possess the advantages or safety of Pasteur's cultivations, though Chauveau has endeavoured to inprove it.

Very early in 1878, Dr. Burdon Sanderson, the Superintendent of the Brown Institution, having received a money grant from the Royal Agricultural Society, undertook some experiments in anthrax ("Journal" of the R. A. Society, vol. xvi., p. 257), in which he succeeded in rendering cattle proof against the lethal inoculation of virus, by first passing the latter through the body of a guinea pig, which it had killed. "The rodents die, but the bovine animals inoculated with their blood or with the pulp of their diseased spleens, recover." And he adds: "The question whether this fact, like the analogous one of the mitigation of human small-pox by transmission, can be directly applied to a practical purpose, I leave to be determined by future inquiry. Its present interest lies in its bearing on the nature of the process of infection in anthrax." In 1879 and 1880, the experiments were continued by Sanderson's successor, Dr. Greenfield, and those who read his reports in the Society's "Journal" (vol. xvi., p. 273, vol. xvii., p. 30), will find that Pasteur's discovery of anthrax protective inoculation by means of cultivated virus, was nearly, if not quite, anticipated by the liberal action of the Society and the scientific ability of its agent. Dr. Greenfield, in his second report, published at the commencement of 1881, concisely gives the object and the result of his investigations, from which it will be seen that, so far as immunity from the disease is concerned, they were the same as those of Pasteur.

"In the course of these experiments, it has been my endeavour to ascertain whether any modification of the poison of the disease could be artificially produced without the employment of animals for the production of the modified virus. With this object, I have made a series of experiments, cultivating the virus artificially in organic fluids, and I have been able to prove that it is capable of gradual attenuation, even to the degree of complete destruction of its virulence, and it may thus be greatly modified, so that a certain degree of poisonous activity may be attained at will." The details of the experiments given, quite corroborate his statement. Unfortunately, we have no Academy of Sciences in this country; and though our agriculture has been most terribly damaged by the ravages of pestilential diseases among animals, yet little attention has been paid to them. Consequently, the Society's efforts and Dr. Greenfield's anticipatory discovery, have, it must be confessed with regret, been allowed to drop out of sight. If we compare England with France, or some other countries, in this matter, we have small cause to congratulate ourselves.

The brilliant success attending Pasteur's public demonstrations in his own land, naturally attracted great attention in other continental countries which suffer quite as much loss as France from the destructiveness of anthrax, and some of these were eager to satisfy themselves as to the efficacy of inocula-

tion, by a trial on their own territory. Hungary made a request, through Baron Kemeny, Minister of Agriculture, for M. Pasteur to make an experiment at Buda-Pesth; this was complied with, M. Thuillier, one of Pasteur's assistants, and who has since died from cholera while investigating that disease in Egypt, having been sent to the capital of Hungary to conduct the official trial in September, 1881. A Commission was appointed to watch the experiment, Baron Kemeny being President, with the chief professors of the Veterinary Institute and of the Faculty of Medicine as members. Sixty sheep and ten bovines were provided, but some of the animals were weakly, and others were suffering from various diseases not apparent before inoculation. One-half of the sheep and one-half of the cattle were set aside as test animals, to be inoculated with the crude virus only. Two of the sheep inoculated with the cultivated virus died from non-specific disease before the final test. When all were treated at last with the deadly virus, the efficacy of "vaccination" was fully verified by the resulting deaths in those not protected, and the immunity of those vaccinated. The Buda-Pesth experiment was repeated at Kapuvar on one hundred sheep and twenty oxen; fifty of the former and fourteen of the latter being "vaccinated," and fifty sheep and six oxen being reserved for tests. Fifty-nine sheep and one test cow died after virulent inoculation, and the surviving sheep and three of the cows were very seriously ill. One vaccinated sheep died, the other sheep and oxen not being affected. Twenty-six sheep of a flock ravaged by anthrax were also protectively inoculated. After the second inoculation ten of these died, and nine again subsequently.

This experiment was considered unsatisfactory, and the reason for its being so was explained by Pasteur as being due to the first inoculation material, which Thuillier took with him from France, being too weak to resist the effect of the second—it had been, unknown to Pasteur, "over-cultivated."

Prussia made application for "vaccine virus," but as the value of Pasteur's discovery was formally contested in Prussia, by Koch and others, Pasteur decided that it would be better to have a demonstrative experiment like that which had been made at Pouilly-le-Fort, Melun. Dr. Roloff, director of the Berlin Veterinary School, took the initiative in this step, by applying to the German Minister of Agriculture to have the experiment made, and to nominate a Commission to report on it. This was agreed to, and the Commission—with H. Beyer, Member of the Superior Council of Government, as President, and Dr. Virchow, Count Zieten-Schwerin, Councillors Zimmerman and Rimpau, several Veterinary School directors—Dammaun, Leisering, and Seidamgrotzky, and several of the leading veterinary surgeons from different parts of Germany, members. Twelve cattle and fifty sheep were collected at a place called Packish, where anthrax had prevailed to a large extent for some time, attacking horses, cattle, and sheep. In one year alone, seven horses, sixty-two cattle, and twenty-two sheep died; and it is to be noted that the outbreaks were more frequent when the animals grazed on certain parts of the field, or when these parts were mown for stall-feeding. The farmer had used this field as the burial-place for animals which had died from anthrax, while other carcasses he put in the manure-heap, which was in due course distributed over the land. The cattle and sheep for experiment were brought from an infected locality, and were divided in two equal portions; and twenty-five sheep and six cattle were inoculated with the primary vaccine without any unfavourable symptoms following. After the second inoculation, however, several of the cattle and sheep became very ill, and three sheep died. The cattle and remaining sheep were soon quite well, and were inoculated with very virulent blood, at the same time as the other half of the animals kept for test purposes. All of the former continued perfectly

well, but all the sheep and three cattle of the latter perished from anthrax. The experiment demonstrated that Pasteur's protective inoculation gives the inoculated animals complete immunity; but its practical utility was doubtful, as twelve per cent. of those inoculated succumbed to the second inoculation. Pasteur was of opinion that the breed of sheep had something to do with this result, so different to that observed in France; and the Minister of Agriculture, accepting this view, put the entire flock of sheep on the farm at his disposal. These were subjected to experiment; and fifty-two head of cattle on another farm were inoculated protectively. None of the cattle died; and the result with the sheep was more favourable than that in the first experiment.

The conclusions or inferences arrived at from these two sets of carefully conducted and closely supervised experiments, were to the following effect:—

"1. Cattle which withstand inoculation with the cultivated material, do not contract the natural form of the disease.

"2. The weakest cultivated fluid *(premier vaccin)* did not produce any sign of disease, either in cattle or sheep.

"3. The second inoculation, with the more virulent cultivated material, *(deuxième vaccin)*, produced a decided rise of the internal temperature and illness, although this was not, as a rule, fatal. At the seat of inoculation, various-sized nodules or swellings formed, which were either painful or painless. None of the cattle died after the second inoculation, but three sheep of the twenty-five used for the first experiment, and one of the 251 of the second, perished.

"4. The controlling experiments with the blood of an animal that had died of anthrax, and with the virulent fluid from Pasteur's laboratory, produced only a slight disturbance in the cattle and sheep that had been previously protected by the cultivated fluids; those animals which had not been so protected, however, became very ill indeed. Of the twenty-five sheep in the first experiment, and which had been inoculated with the protective fluid, none died; of the twenty-four in the second experiment, two lambs succumbed—one fourteen days after inoculation; but both were weakly animals, which may account for this unfavourable result."

(*To be continued.*)

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## SHORTHAND NOTES OF TWO LECTURES ON POISONING OF HORSES BY LATHYRUS SATIVUS.

BY PRINCIPAL M'CALL, F.R.C.V.S., VETERINARY COLLEGE, GLASGOW.

(*Continued from page* 342.)

### *Microscopic Examination.*

The *blood* was examined at frequent intervals during the experiment, and until animal was killed. It was examined both fresh and after staining with aniline dyes. Many of these examinations were made with the aid of a powerful oil immersion objective by Powell and Lealand. In no case were organisms seen, and it may be confidently asserted that none were present either in the blood or textures of the body.

The *ganglionic* cells of the motor cornua of the spinal cord were very much diminished in number, and more or less atrophied. This was well marked in one section just under medulla, and in this section the neuroglia was distinctly increased, and many of the cells had lost their processes, and had undergone more or less pigmentary degeneration. There was also a well-marked thickening of the coats of the small arteries running in the grey

matter. The *muscular fibres* of the intrinsic muscles of the larynx, although still distinctly striated, showed fatty metamorphosis. Between the fibres the connective tissue and fat were greatly increased, indeed this was evident to the naked eye. The muscles of the left side were most affected, and especially the Crico-arytenoideus posticus.

The *heart* was also examined, and showed to a certain extent the same change as the muscles of the larynx, viz., fatty degeneration.

The lungs were much congested, and some evidence of catarrh was present; otherwise they appeared healthy.

The walls of the stomach were congested, but nothing else was seen to account for the thickening of them.

The small intestines were in a similar condition to the stomach.

*Chemical Examination.*

Prof. Cooke could not discover anything in the pea, but that it was very rich in albumen.

By a brief analysis of this experimental case, I think we arrive at the conclusion that disease in this animal was the result of the diet upon which it was fed, and, as has been stated, that was almost entirely raw Indian peas of the variety termed "Lathyrus Sativus," and which I now hand round for your inspection. These peas, or something mixed up with or adherent to them (but more of this hereafter), have the power of functionally disturbing the nerve centres, more especially of respiration and circulation, and, if persisted in as an article of diet, of leading to organic disease, not only of the nerves themselves, but also the organs in which they are distributed. The functional disturbance may be so marked as with slight physical exercise to lead to instant death by "Apnœa," or so called "Asphyxia."

The mode of death, whether due to organic disease, with of course functional disturbance, or functional disturbance alone, is the same, viz., "Apnœa," and is as marked as if you strangled the animal by compressing his larynx with a rope.

*Treatment.*

We administered a variety of medicinal agents, but none of them were attended with lasting benefit. The only real benefit that the animal derived was from the performance of a surgical operation. It was the only thing that was needed to relieve this distress of breathing. We had recourse to tracheotomy. When we put the tube in, our case got all right. No specific agent had any power to relieve the animal. Tracheotomy was performed on the bulk of the subjects that came under our notice, and almost all of the animals operated on not only recovered, but in a few weeks could dispense with the use of the tracheotomy tube. One animal required to wear the tube continuously afterwards, but that animal was a "roarer" before operated on.

After the cessation of the outbreak, as the firm had a large quantity of the peas in stock, I recommended their use in a boiled state with other food, and they were all used up at the rate of 1½ lbs., per horse per night, and without any abnormal symptoms or disturbance of health.

The inference we draw from this is, that boiling the peas destroys the poison, or at all events modifies the action of the active principle, or poison, contained in them, and its action on the nervous system. At my farm I experimented with the peas, giving them *ground*, and *scalded* to fattening *bullocks*, and they did well on them. I also fed sheep with the *raw* unground peas, and they also did well, so that the poison in the peas apparently has not, in the quantity I gave, viz., 3 lbs. to cattle and 1 lb. to sheep, the same action on them as on horses; but still I would not advise their unguarded use, as my experience has been too limited. The symptoms are so distressing

and peculiar, so urgent and alarming, that once seen and studied, I think poisoning by the "Lathyrus Sativus" cannot be confounded with any other disease in which roaring and distress in breathing are prominent symptoms.

By way of bringing this home to you, I may just mention that months after the disease had disappeared in Glasgow, and all thoughts of it had fled from my mind, about eight o'clock one morning, as I was in the act of driving out the college gate, a man met me in the teeth, dragging along a powerful and valuable black horse. The noise was something alarming, and the anxiety of expression and force of thoracic and abdominal breathing heartrending to behold. I pulled up to let the man pass, and without leaving the vehicle, diagnosed the case, and ordered there and then tracheotomy to be performed. When I informed the person in charge of the horse that his horse had been poisoned by eating Indian pulse, he said that I was mistaken, as he could assure me that the horse got no peas or beans but the best of Scotch oats. He said the horse only commenced to roar this morning, and as he showed the same symptoms as the other horse which died suddenly yesterday morning, and which one of my assistants had seen, he deemed it best to bring him along at once. I replied that, "Get the pulse how he may, the horse had been fed on them, and fed for a time." It was arranged that a sample of all the feeding in his possession should be sent to the college for inspection. The hay was first-class. The oats very good. The oats in quantity sent measured about a feed. I spread them out on brown paper, and from that quantity picked out the peas and pulse contained in this bottle I now show you, and which, although split, in many instances, you can have no difficulty in recognising as largely the "Lathyrus Sativus." The pulse were there, you see, and in such quantity as to be unknown to the persons purchasing and feeding the animals, and although the horse recovered after tracheotomy and alteration of diet, can you doubt that that animal for a considerable time had been imbibing the poison, and probably would have died from its effects, seeing his neighbours succumbed to it? It is a cumulative poison, and in this respect not unlike digitalis. What object had the grain merchant in view when he mixed the Indian vetch with the oats? To poison the horse eating them? Certainly not; but to make money, the vetch being much cheaper than the oats, yet being sold by weight for the same price. There are several varieties of Indian peas and vetches, and you will find, as a rule, in the identical same cargo and same sack, several varieties. It appears to me that in India they really don't grow these vetches pure, but fortunately—at all events, as far as my experience goes,—the "Lathyrus Sativus," which produces this form of roaring leading to death, differs from all the others in being more or less square, angular, and flattened in its shape.

Still further, as bearing upon the subject as to whether this variety of Indian pulse is poisonous, not only to horses but to men, I shall now read you an article which appeared in the *Field* towards the close of our experiments :—

"This plant, 'Lathyrus Sativus,' bears the vernacular names of Kasari, Kassar, Tiura, Tiuri, and Latri. It appears that it is grown as a cold-weather crop on land which will raise no other kind of pulse. Its cultivation is commonest on very heavy clay soil, and it is frequently sown on land which is submerged in rainy seasons, and which hardens during the cold weather almost to the consistency of stone splitting up into long deep fissures. There are other reasons why so dangerous a kind of pulse is cultivated.

"After prolonged floods it occasionally offers a means of raising a cold-weather crop from land which would otherwise be unculturable, since it can be sown broadcast on miry ground, and is not so injuriously affected as many other crops by the subsequent hardening of the surface. It is also occasionally

sown in rice fields even before the rice is cut, springing up between the rice stalks, and yielding a crop in the spring, while the rice stubble is still standing.

"Its undoubted tendency to produce paralysis has been ascribed to the nitrogenous constituents in which it is exceptionally rich. Widespread occurrence of paralysis has taken place in various districts after Kasari has been grown on an exceptionally large scale, and cases of paralysis in the military station of Almora a few years ago were traced to the fraudulent admixture of Kasari with the grain supplied for the use of the troops.

"In consequence of the failure of other crops, Kasari was largely consumed in the Eastern villages of Oudh about fifty years ago, and Col. Sleeman reported thereon as follows :—'In 1833 the sad effects of this food began to manifest themselves. The younger part of the population, from the age of thirty downwards, began to be deprived of the use of their limbs below the waist by *paralytic strokes, in all cases sudden*, but in some more severe than in others. About half the youth of both sexes became affected during the years 1833 and 1834, and many of them have lost the use of their limbs entirely, and are unable to move. It is the prevailing opinion of the natives throughout the country that both horses and bullocks which have been much fed upon Kasari are liable to lose the use of their limbs.'"

In the VETERINARY JOURNAL and *Veterinarian*, for April, 1885, the Messrs. Leather, of Liverpool, contribute a most lucid, scientific, and convincing article on Lathyrus-poisoning in horses under their charge.

Principal Williams, of Edinburgh, in his Inaugural Address to the Scottish Metropolitan Veterinary Medical Society (also published in the same journals), refers to the same disease, and I advise you all to carefully peruse these articles. According to the Messrs. Leather the cause of the disease is a something (poison) in the pea, and according to Principal Williams a something (bacilli) in the dust or dirt surrounding the pea, but not in it. Both are agreed, then, that either the peas (vetches) or something mixed up with them contain the poison.

For many reasons, but I will only mention a few, I agree with the Messrs. Leather :—

*1stly.*—In blood-poisoning by specific (pathogenous) organisms, I have always found well-marked febrile disturbance. In this disease there was no increase of temperature, and an entire absence of pyrexial phenomena.

*2ndly.*—Examinations of the blood fresh drawn, stained and unstained, revealed no microbes.

*3rdly.*—Examinations of the tissues, exudates, and extravasates gave also negative results.

*4thly.*—Changing the diet arrested the malady. If the diet contained a poison, vegetable or mineral, this is what we should expect, but if it contained a specific pathogenous bacillus, and these bacilli produced the disease, we should not expect that ; because the bacilli live and reproduce themselves in the blood and tissues of the affected animal, and a change of the diet, if the food be sound, will not destroy them, neither is it necessary for the life of bacilli that Indian peas be given as an article of diet.

On the other hand, if the disease is dependent on an alkaloid contained in the "Lathyrus Sativus," then the administration of the vetch or the alkaloid contained in it, is required for the maintenance of the disease.

*5thly.*—The surgical operation tracheotomy arrested a fatal termination, and if performed early and the diet changed, a rapid convalescence in every case was the result, and without the administration of medicine. Tracheotomy prevented death, not by destroying the vitality and action of the bacilli or other living organisms—for, as a rule, the larger the amount of oxygen in the blood, the more rapidly is the reproduction of disease-producing microbes ; but by allowing air freely to enter the lungs at the time when, from spasm,

or paralytic powerlessness of the dilator muscles of the larynx, air could not find an entrance in sufficient quantity to the chest.

*6thly.*—It is the usual condition to find Indian peas, vetches, and beans of all varieties, mixed with considerable quantities of dried earth, dust, rat, and mice dirt, etc., but no other variety than the angular vetch Lathyrus Sativus has produced this nervous form of "roaring" and death in this country.

*7thly.*—The vetches given to the mare in the last experimental case were as clean and free of dust as possible.

*8thly.*—Dust and dried fæcal matter have always bacilli and micrococci present in them, so that Prof. Williams would have no difficulty in "making cultivations," and the same applies to diseased lungs or bowels, both being exposed indirectly to the air.

*9thly.*—Granting that there is a pathogenous bacillus present, it has yet to be isolated, then inoculated and produce the disease, and, finally, re-inoculated, with reproduction of the malady.

*10thly.*—That it is a specific poison and has no power of reproduction in the body, and that it acts in virtue of the quantity administered, is to my mind as clear as the evidence in favour of morphia, strychnin, digitalin, and other medicinal poisons.

The Lathyrus Sativus contains a poison, and that poison has a specific action on the pneumogastric nerve, and more especially the inferior or recurrent laryngeal branches, and this action is as well marked as the action of digitalis on the heart, and to which, in my opinion, it bears a great resemblance.

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## RECENT OUTBREAK OF SPLENIC APOPLEXY IN SIOUX CITY, IOWA, U.S.A.

BY T. BOWHILL, M.R.C.V.S., STATE UNIVERSITY, LINCOLN, NEBRASKA, U.S.A.

### *History.*

NUMEROUS complaints of cattle dying suddenly were brought into town. I had no opportunity of seeing any of the animals till the death rate was becoming alarming. At length I was called to make a *post-mortem*, and also to examine some sick animals, which died in about twelve hours after I saw them. On opening them the appearance of the spleen and serous membranes caused me to think the *causus mortis* was either Anthrax or Texas Fever, but I was inclined to the former. The same day I was called to make another *post-mortem*, the appearances being similar but more pronounced. I asserted the disease to be Splenic Apoplexy. I could not examine the blood for the Bacillus Anthracis as my microscope was at a distant town—my presence in Sioux City at this time being accidental.

On consideration of the matter, and recognising the greatness of the interests involved, I thought it my duty to lay the matter before the City Council immediately. Having done so, I advised the Council to telegraph for the State Veterinary Surgeon to order all the carcases to be burned, all the cattle in the infected district to be quarantined, and gave the necessary instructions concerning butchermeat and the milk supply. The increase of the disease occasioned considerable alarm ; so much so indeed that the Council requested the Health Officer and President of the Committee to interview me. Having stated my conclusions, they requested me to make a *post-mortem* of a cow that had died that morning, which I did in the presence of the Health Officer and Dr. Park, an Edinburgh physician. I found the lesions exactly those of Splenic Apoplexy, as described by Principal Williams and Dr. Fleming, and the medical men were convinced.

The newspapers of the succeeding day contained the opinions of several empirics, and one from another M.R.C.V.S. in the town, which I enclose :—

To the Editor of *The Journal:*

In your issue of the 3rd occurs a report made to the Council by Dr. Morrison, in which he plainly states that there are cattle dying or have died on the West Side of some contagious disease. Now I should be doing an injustice to myself as well as to some of my clients if I did not offer an opinion to the public. In my opinion there is not contagion or infectious disease amongst cattle in this district. I have been called to several cases on the West Side reported to be Texas Fever, Splenic Apoplexy, or some other form of Anthrax. I have cured them all with medicine. Now if it is the disease it is reported to be medicine would have no effect. My opinion is that it is brought on by the cattle eating some weed in the pasture which acts as an astringent on the stomach — causing indigestion, then impaction, and terminating in inflammation. I don't want to write any scientific paper on the subject at present, but I may explicitly state that in offering my opinion I do not consider my qualifications for the self-imposed task to arise from any fancied superiority or perspecuity of intellect, but from the very homely circumstance of practical experience.

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I had to endure considerable opposition also from the cattlemen of this district—Sioux City and neighbourhood being the centre of the cattle trade for north-western Iowa. The cattlemen were alarmed at my statement concerning the disease, and held a meeting at which they decided to send for Dr. F. Billings, a specialist (who is at present engaged in investigating the Hog Cholera in Nebraska). On his arrival at Sioux City there was a temporary lull in the death rate, and consequently no immediate opportunity for *post-mortems.* One animal, however, being discovered with a temperature of 104 deg. Fahr., was purchased by certain cattlemen in order that Dr. Billings might make an autopsy and settle the question in dispute. They decided that the killing should take place at 4 p.m., but the animal saved them the trouble, as it died at 3.30. Dr. Billings made his autopsy with my assistance, and got numerous slides mounted and agaragar (or Japan isinglass) inoculated. On placing the slides under a microscope Dr. Billings at once detected the Bacillus Anthracis, and pronounced the disease to be Splenic Apoplexy. Immediate endorsement from such a high authority as Dr. Billings was naturally agreeable to my feelings, and I wish to seize the opportunity of expressing my deep sense of his courteous treatment. I sent a microscopic specimen to Principal Williams, New Veterinary College, Edinburgh, from whom I received the following statement: "There is no doubt it is the Bacillus Anthracis. There need be no mistake, as the characters of the organisms are beautifully brought out."

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agaragar cultivations, which developed splendidly, and I found on mounting a specimen the spores and filaments beautifully demonstrated. A few days after we had marked out the quarantine district the cattle in a large pasture of two hundred and forty acres began to die. I again made two autopsies with identical results. There were about sixty deaths in the pasture, and as I visited it almost daily for two weeks I was able to observe a good many symptoms, which I will now describe.

*Symptoms.*

The following is a table of temperatures, taken with difficulty, owing to the necessity of lassoing the different animals:

| | Temp. Fahr. | | Temp. Fahr. |
|---|---|---|---|
| 1 work ox ... ... ... | 102 | 1 work ox ... ... ... | 102 |
| 1 calf ... ... ... | 105 | 1 heifer ... ... ... | 103.2 |
| 1 heifer ... ... ... | 102 | 1 heifer ... ... ... | *105 |
| 1 heifer ... ... ... | 106 | 1 heifer ... ... ... | *106.3 |
| 1 cow ... ... ... | 103 | 1 heifer ... ... ... | 107 |
| 1 cow ... ... ... | 106 | 1 work ox ... ... ... | 101 |
| 1 cow ... ... ... | 107 | 1 work ox ... ... ... | 102 |
| 1 work ox ... ... ... | 101.4 | 1 young heifer ... ... | 106 |

Those marked with * recovered. I watched them particularly, having marked them, and they are now well and in good condition.

The first great symptom observed was isolation, connected with blowing and stiffness of hindquarters, with elevation of temperature, 107 deg. Fahr. being the highest I found. One or two animals attacked became delirious, and charged the attendants. Rumination was entirely suspended. Those animals nearly always remained in the recumbent position, and were raised with difficulty. When standing the back was arched, legs rigid; heart beat with violence against thoracic walls; pulse small, rapid and irregular. Some of them prior to death had a sanguineous discharge from the *anus;* others had not, whilst others had a similar discharge from the nostrils—in some cases vomition occurred a few hours before death. There was also more or less tymphany and diarrhœa present; the anus and vulva more or less everted and of a dark colour, as were also the other visible mucous membranes. Towards death the eyes became sunk in the orbits, and ecchymosed spots in most instances on the mucous membrane of mouth, anus, and vulva. In one case pustules formed on the anus prior to death, but in other cases the pustules were absent. In milch cows the first great symptoms were: (1) The partial cessation of milk; (2), prior to death, the ears became cold and then the limbs. After these changes convulsions, resulting in death during the fit, or in the calm that preceded it. The best and fattest of the cattle, particularly young heifers, went first. Some died in a few hours; others again lingered for several days, and, after apparent fictitious improvement, would suddenly manifest acute symptoms and die. The work oxen, marked in the list of temperatures as normal, were the last to become affected, but on attack succumbed rapidly. Some of the animals during life voided dung covered with blood and urine full of blood, resembling hæmo-albumenurea. One case occured of a cow that calved and died the day afterward, the symptoms at first resembling those of Parturient Apoplexy, the cow being isolated and never having come in contact with infected pastures or animals, proving how difficult the origin of the disease (in this case) was to trace. Could not this be due to flies carrying the contagion, or to contagion in the hay the cow was fed on?

### *Treatment.*

Knowing the nature of the disease, and having no clear line of action laid down ("by precedent") I instituted preventive measures. That all animals should be kept in sheds, the doors secured to prevent the entrance of flies. Internally I prescribed, to affected, and unaffected animals, within quarantine district, Acid carbol, 2 drachms ; Ol lini, 1 pint, and also powders, containing Pot. chlor. and Soda hypo-sulph., and to others powders consisting of Sodæ sulphitis. Many of the sick animals so treated lived, whilst others recovered without any treatment. This forced me to the conclusion that the main curative agent was the constitution, which, if strong enough, could resent or indeed overcome the virus. I experimented also after the Russian method, *i.e.*, tapping the spleen between the two last ribs, and found I had to tap further forward between the third and fourth. This, however, resulted in failure in every case as the canula became occluded with splenic pulp.

### *Post-mortem Appearances.*

Having laid the animal on its off side, removed the fore-leg, cut along the linee alba as far as the pelvis, then cut through the superior end of the ribs and removed the whole of the left flank, the first thing that attracted my attention was the ropy, tarry condition of the blood ; secondly, the early decomposition of the carcase. The spleen was enormously enlarged, the capsule distended and stained, and, on cutting it open a dark fluid escaped of a maroon colour, consisting of the disintegrated splenic pulp.

*Lungs*—Studded with numerous ecchymosed patches, especially on the pleura costalis and diaphragmaticis, and more or less emphysemotous.

*Heart*—Pericardium enlarged and a considerable amount of serum between its layers, also petechæ. The endocardium was studded with ecchymosed spots, which could not be removed by washing. The internal coat of the large vessels leading from the heart presented a strained appearance, and said vessels were full of uncoagulated dark blood.

*Liver*—Enlarged, and on cutting, an escape of black blood, looking as if it had been boiled. In Texas Fever the organ is of yellow colour, accompanied with distension of the bile ducts, giving a streaky appearance of a bright yellow nature.

*Rumen*—Full and distended with gas, the mucous membrane being highly congested and easily separated.

*Reticulum*—Partially filled, and its mucous membrane similar to that of the rumen.

*Omasum*—Contents hard, with mucous membrane congested, and of a dark colour, part having peeled off and mixed with the contents.

*Abomasum*—Contained little food ; mucous membrane very highly congested, and entirely abrased in some parts.

*Intestines*—Highly congested throughout, and covered with ecchymosed spots.

*Peritoneum and Mesentries*—Covered with ecchymosed spots, and the large veins of the mesentery full of blood and elevated. In one case only did I find Anthracoid tumours in the mesentery.

*Kidneys*—Highly congested and very fliable, due no doubt to the great pyrexia ; studded with numerous black petechæ, but no pus in the pelvis, as I am informed is the case in Texas Fever.

*Nervous System*—Meninges of the brain were covered with black petechæ, and in the ventricles of the brain I found clots of blood.

*The Bladder*—In most cases full of urine of a sanguineous colour, and in some cases entirely empty ; in *every case* the mucous membrane was more

or less congested, and in some cases the vagina was covered with ecchymosed patches. One peculiarity of the blood was the absence of coagulation and dark colours in every instance.

In conclusion, I would like to advance a few ideas concerning the cause of this outbreak. For the last two years cattle in small numbers have died in a similar manner. The months of June and July of this year being marked by abnormal heat and drought, numerous cracks and fissures were visible on all grazing grounds. The carelessness of owners of defunct cattle in the previous years, as shown by permitting the carcases to remain in pastures covered with immense swarms of flies, has undoubtedly allowed said pastures to become Anthrax centres. The opening of the ground has released the spores of the disease, and thereby caused the scourge under discussion. Another theory of mine arises from the fact that the majority of the diseased cattle were in the habit of grazing along the banks of the Missouri, and in a portion of the river bottom, which is as Dr. Billings tersely styled it, a regular "Anthrax hole."

One final instance of criminal carelessness I wish to relate by way of introducing my definite conclusion concerning the spread of the disease The carcase of the first victim I saw was left to rot in an inlet of the creek which, running through the town, supplies a large proportion of the animal population with water. I found said carcase in the same position *fourteen days* after I had ordered its entrenchment.

I have no doubt whatever in my mind, that had the stock-owners conscientiously acted according to our orders and faithfully carried out the quarantine regulations, the disease would have been immediately stamped out. But given carelessness, wanton infraction of sanitary laws, and ignorant opposition to the advice of experts, *pestilentia ad æternum.*

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## MACHINE-MADE HORSE-SHOES AND COLD FITTING.

By H. Labhart, Veterinary Surgeon, Remount Department, Swiss Army.*

It cannot have escaped the notice of my colleagues that, recently, endeavours have been made to introduce machine-made shoes. The battle between the defenders of machine-made shoes and the adherents of the customary method has become rather hot, and it will strike many of the readers of the periodical, *The Farrier*, that even authorities upon shoeing take their standpoint too much upon the question of trade. It goes without saying that next to the technico-scientific question, the politico-economical one presses to the front.

In No. 11, 1885, of *The Farrier* (*Hufschmied*), Mr. Kliemchen (master shoeing smith in Dresden) calculates that in the German Empire, with an equine population of 3,500,000, 2,800 shoeing smiths would be without bread if (supposing each horse was shod all round eight times a year) a quarter of that number were shod with machine-made shoes. Therefore, if the entire demand were thus supplied the total number of men thrown out of work would be 11,200.

Such a prospect is certainly very distressing to the workmen, and Mr. Tittmann, from Mainz, is partly to be excused when he writes: "The duty of self-preservation forbids shoeing smiths to make themselves dependent upon the manufacturer; every shoeing smith should be at enmity with machine-made shoes" (No. 6, iii., *The Farrier*).

* Translated from the Schweizer-Archiv für Thierheilkunde, by F. Raymond, F.R.C.V.S., Army Veterinary Department.

The history of our century, however, teaches us plainly how unceasingly and recklessly machine work outsteps handicraft, and will continue so to do.

All declarations and agitations in favour of manual labour will be dashed to the ground, so soon as it becomes apparent that mechanical products are as good, or better than manual products.

As I have had opportunities of watching experiments on a large scale with machine-made shoes, and have seen and tested those of every known firm, I beg to express my views upon the technical question.

At the outset, I desire to refer shortly to the practice of shoeing with caulkins. When I preach the banishment of caulkins and toe-pieces from summer shoes, I am aware that I am warming up a stale dish in the art of shoeing. But I do not hold it as superfluous, for not only do some of the general public, narrow-minded horse owners, and shoeing smiths, maintain a blind belief in these ruinous adjuncts to the shoe, with great tenacity, but even among veterinary surgeons, worshippers of the caulkin are to be found. Without going into explanations, I will confine myself to calling attention to the unnatural position the foot is put in by the caulkin, and the removal of the frog from the ground, although the frog is intended by nature to support a great part of the weight. When it is further considered that the frog acts as a buffer against concussion, and the unfavourable position it is placed in by this method, particularly in carrying and riding horses, called upon to move and to stop suddenly, or to jump, the disadvantages of caulkin shoeing become apparent. All these drawbacks are accepted by many in consideration of the prevention of slipping thereby attained. The assertion that "horses fall more frequently without caulkins" is false, and has long been disproved.

In London and Paris heavy draught and carriage horses for many years have travelled on the slippery asphalt without them; German towns show similar proofs; in Dresden, for instance, the tram horses have no caulkins. The tram horses in Zürich work constantly in summer, since last year, upon a slippery and somewhat curved surface, with plain shoes. The riding horses of the English, German and French armies, are almost all shod without caulkins. We, also, have favourable experience with cavalry shod without them, even upon stony, uneven ground. Reports from Bulgaria by Army Veterinary Surgeon Chelchovsky confirm the same. Everywhere where caulkinless shoeing is practised the good condition of the feet is recorded, and little is heard of the bad results of slipping or falling. It is also worthy of remark that the friends of caulkins show no fear of slipping when the caulkins are quite worn down, and allow their horses to go about as before, without anxiety.

It is very satisfactory that with machine-made shoes, we no longer have to fight such old traditions.

Cold shoeing is no new idea. For a long time military horses on service have had store shoes put on in this manner. The general introduction of this method was tried in France, in accordance with the rules laid down by Ricques, with the assistance of his Podometer. In 1845, the French Horse Guards ordained that cold shoeing should be introduced in all cavalry regiments. In 1854, a fresh order was issued stopping the practice, because it was reported that the shoes could not be fastened so tightly, and took too long to fit. With the production of machine-made shoes, military circles again became agitated upon this question; Englishmen in particular, after having for several years experimented on a large scale in the army and tramway companies, report favourably upon cold shoeing.

For military purposes it is of the utmost importance to possess a shoe which can be applied cold, because the shoeing can be done quicker, and the complicated and clumsy field forges can then be dispensed with. It

would be difficult in war time to accomplish shoeing with the present arrangements.

The experiences of the Franco-German war show that many horses were lamed from the loss and non-replacement of shoes, bad shoeing, and want of removes, etc.

In the report of Staff-Veterinary Surgeon Ableitner, it is shown that the second highest percentage of all the diseases in the Bavarian army arose from causes of this description.

In consideration of this proportion, a resolution of the Swiss Military Department ordered extensive trials to be carried out this summer in the artillery and cavalry of our army.

Should machine-made shoes satisfy the demands of the art of shoeing, we should gain not only the advantages mentioned above (which would be most appreciated in the army, and by large horse owners), but we should obtain a better and much cheaper method. These last are factors which would influence all horsemen, and would go far towards promoting a general introduction of the shoe.

It is, unfortunately, only too true, that by far the greater number of our blacksmiths are unskilful workmen, and that properly made shoes are exceptional. Nobody has better opportunities of seeing this than veterinary surgeons. I have particularly noticed how badly we stand in this respect, when I have taken over remounts bought inland, and also at revisions and valuing of military horses. Even smiths whose trade is almost entirely confined to shoeing, make outrageous blunders in the first and most important principles of shoeing; and the country smiths are naturally worse. The want of good shoeing smiths is felt, not only by us, but also in other countries. We receive horses from the great breeding provinces of North Germany, with even worse shoes than are to be found in ours. In No. 12 of the *German Army Gazette* of last year there is a quotation from the *Turkish Farrier* (No. 10 of the previous year) wherein it is stated that 90 per cent. of the Swiss shoeing smiths do not understand their work. I believe that Provincial Veterinary Surgeon Timdel, of Strasburg, was the first to find this percentage at the local forges.

There is no great choice between us (excepting in military shoeing), but it must be confessed that in high places in Germany this want has long been recognised, and a great deal has been done to diminish these evils. By the law of July, 1883, the pursuit of horse-shoeing is dependent upon the passing of an examination.

With our present knowledge of engineering, it is not difficult, with the assistance of professional men, to produce machine-made shoes. As a rule, such shoes are turned out of better make than those produced by hand labour. We shall therefore by this means obtain a better, even a much better shoe generally, than is at present made by clumsy smiths. I shall attempt to prove later on the truth of my assertion.

Machine-made shoes are naturally much cheaper than hand-made ones. Where the quality is equally good and sometimes better, the machine-made shoe will make many friends by the selling at cheaper prices. Compare the price of hand-made with machine-made shoes.

Let us now examine the shoes which have been sent me from different manufacturers.

The first known machine-made shoes were those of Suchaire; they were formerly produced in the workshops of Messrs. Martini and Tanner, in Frauenfeld. The present Luchaire shoes are made in Hayen, Westphalia, and are a great improvement upon the first attempt. They leave little to be desired as regards shape, level, and nail-holes. They are sold as near fore and hind, and off fore and hind. They are fullered and seated, and have a level bearing.

They have no toe-piece, but are perfectly level and smooth. The holes of the ten different sizes suit the different breadths of the web. There are no caulkins. The clips should be smaller and thinner. The fullering is a little too wide, so that the shoe is rather weakened, and the nail-heads do not hold tightly enough. These faults can be easily corrected.

The quality of the material may be objected to to a certain extent; it is not hard enough. It is true that from this cause the shoe may be easily fitted when cold, but it wears rapidly, and is liable to press upon parts which should not be pressed upon. The price is too high: we were charged 2.70 frs. to 2.90 frs. a set for medium-sized shoes (carriage paid). For large orders a considerable reduction should be made. Nos. 5 and 6 were used for heavy riding-horses and carriage-horses. The machine-made nails for these shoes are good.

In England, the shoes of the Horse-Shoe and Nail Company, London, have lately been strongly recommended. It appears that they have been employed over there for some years in the army, and in the greater tram companies. Although the advocates of the new shoes desire to upset some of the principles of shoeing which hitherto have never been combated, and indeed have been held sacred, a sworn commission has pronounced for further experiments on a large scale; chiefly because reports and communications from the land of horses and sport have awakened trust, and the trials during three riding-school courses have not been followed by deterring results.

The above-named Company delivers shoes of various patterns for hacks, hunters, carriage, heavy draught-horses, ponies, etc., as required. The shoes which have been sent to us as samples are from No. 1 to 6 (there are, I believe, ten sizes). They are flat, without toe-piece or caulkins; they are fullered, and are not bevelled on the foot surface. They are provided with one clip for the fore-shoes and two for the hind. There is a seating-groove from the inner edge to the outer, probably to prevent dung, snow, etc., from adhering, and to tighten the shoe. The nail-holes (6 to 8) are punched farther back than is generally prescribed. The toe-nail holes are farther from the toe, and the last quarter nail-holes are considerably behind the middle of the quarter. The iron is harder than the Luchaire shoes, and yet it can be fitted cold. The quality of the last batch appears to be better than the earlier lots, for hitherto only a small percentage have broken when used cold, and no clips have been broken.

It is desirable that near and off-shoes were made, because the form of the inner quarter has always to be altered, and the nail-holes are rather too coarse for the inner quarter. In consequence, the inner heel is too long, and, to prevent the nails binding, the shoe cannot be put on as close as should be, and protrude beyond the hoof on the inner side. The fullering is somewhat too narrow, and the outer edge (of the fullering) should be more oblique. With the fullering made as at present, it is impossible to fasten the shoe tightly upon hoofs with oblique walls, such as flat feet and "knollhuf." One clip is generally sufficient for a hind-shoe. Shoes with two clips are always more difficult to fit. The clips are drawn out too strongly. The shoes differ principally from those of Germany and France, and, from our ideas of shoes, as regards the holes and the non-bevelling on the upper surface.

I acknowledge willingly that shoes hold better by this method, which, particularly for riding-horses, is of the greatest importance; but we, from our experience, would expect all the bad results—hoof-binding and bruised soles—from constant use upon hard roads. Otherwise the shoe is perfect in shape, is level, and the other nail-holes are well punched. The price is according to weight, and the price of a set of medium size, carriage unpaid, is 1.20 frs.

The shoes from the Copenhagen factory are also fullered and seated, with or without caulkins. They are sold only as fore and hind-shoes. The fullering is good and the nail-holes well made. The material, particularly of those made with Swedish iron, is excellent. We were able to hammer the two

sides together and re-open them, when cold, without breaking. The clips might be a little smaller, the seating a little more regular, and the shape of the fore-shoes a little rounder. These slight faults could be easily altered, and then this shoe would be the best. The price, compared with the quality and with other machine-made shoes is small: 1 Kg.=42 cts., and four medium sized shoes, weighing 2 Kg.=84 cts., to 1 fr., carriage unpaid.

Besides the factories mentioned, there are three large establishments in Germany which make half-finished shoes, which have to be finished by the smith before fitting.

It will be understood from the above descriptions, and still better by seeing the shoes, that shoes can be made by machinery which meet all the requirements of the farriers' art, or of horse owners. We find that what is faulty in one shoe is rectified in another, so that it is easy to produce a shoe which shall be technically and scientifically perfect, by machinery. If the faults of the Luchaire and Copenhagen shoes be rectified, and if the English shoe is proved to be as good as it is supposed to be, then we possess three sorts of very good shoes, such as a good smith cannot beat by hand labour.

The good make of the Luchaire and Copenhagen shoes is recognised by the highest authorities, and even by the enemies of machine-made shoes; but many defenders of hand-made shoes say that every shoe must be made according to the foot, and therefore a machine-made shoe will never fit.

Let us see how the smith works. When a horse comes to the forge, the smith fits the shoes from the half-finished stock. These are plain, fore or hind, or near or off shoes, without clips or caulkins (in English shoes, they are fullered and seated). These shoes are heated; the smith draws out the clip, puts on the caulkins and the toe piece, and shapes the shoe to the foot. Nobody will deny that the clips and a moderate toe-piece can be drawn out of a finished shoe (this can also be done cold, as it is only exceptionally required) without spoiling it. We will not have caulkins; it is therefore only a question of fitting the shoe. Machine-made shoes are therefore fitted in the same way as hand-made ones.

When good material is used, these alterations are easily made. The smith makes no alteration in the nail holes and seating (in English shoes). As the breadth of the hoofs differ he spreads or closes the shoe, as is done with hand-made shoes. Therefore upon close investigation it is seen that the hand-made shoe has no advantage.

It is not asserted that occasionally special shoes have to be made for flat, full, or pumised feet, for horses that brush or have weak or broken hoofs; but they are exceptions, and many trials have shown us that amongst the different sizes of the machine-made shoes there is choice sufficient to shoe nearly every horse properly.

In Number 10 of *The Farrier* of 1885, Count von Einsiedeln fears that machine-made shoes may be nailed on without fitting, whereas the old shoe was made for the foot. As regards military horses, this argument falls to the ground, because an order can be given as to what is to be done. Civilians will also have to fit the shoe. It is to their own interest that a horse shall not be rendered useless by brushing or being pricked, etc. The excuse that it is the fault of the machine-made shoe is not sufficient, as many laymen and all professionals know that the fault is with the smith and not with the shoe. But a man who cannot fit a ready-made shoe, either cold or hot, can do less with a half-finished one.

As has already been mentioned, cold shoeing has lately been greatly recommended. We have not permitted any of the machine-made shoes to be heated during our trials (which have lasted over a year). Our observations have proved that shoes may be well fitted and put on by the cold method. It is objected to the cold method that the shoes never fit as tightly (Count

von Einsiedel says, as air-tight) and that they therefore do not remain on as well; that it is more difficult to fit them and takes longer.

I admit that it is not as convenient, and that it takes more time, to fit a shoe by the cold method than to burn it on; but there is no difficulty about the operation. If the workman uses his eyes properly, and reduces the hoof with the rasp instead of the knife, he will, with a little practice, get the bed so level that the bearing will be even everywhere. It may take more time to fit than when the iron is hot. The loss of time in making the bed by the cold method, is compensated by the gain elsewhere. If the shoe is fitted on very hot (which it ought not to be), it is possible that an air-tight connection may be established between the iron and the hoof; but under ordinary circumstances this is not the case to a greater extent than when cold shoeing is carefully carried out. If the shoes are put on properly, they will adhere just as well by the cold as by the hot method. In this respect we have noticed nothing prejudicial during our trials, which, however, are still being carried out, with horses which have always to travel upon hard roads.

In favour of cold shoeing, it is pointed out that no fire is needed, that therefore time and coal are saved, in armies heavy forges are no longer required, and that the bad effects of burning the hoof cease to exist altogether.

When speaking of the three sorts of machine-made shoes, I stated that none of them comply completely with what is required.

How, then, is a machine-made shoe to be produced which is suitable for cold shoeing?

1. It must be made of the best iron. It may almost be said that no shoe can be put on without having its shape altered. If that is not done the hoof is made to fit the shoe by trimming and rasping, which brings with it the usual drawbacks. In winter bad iron breaks very easily. Good material wears longer and does not become bent, *i.e.*, does not unduly press upon any particular part where it should not (causing corns, sand cracks, and seedy toes).

2. As regards shape, we should insist upon having near and off fore and hind shoes. By so doing, the shoes will require less fitting and the holding will be better.

3. There should be about ten different sizes of shoes. For medium and large riding horses and carriage horses, there should be four or five sizes, besides those for ponies and heavy draught horses. The shape and size are difficult to describe by numbers, because the sole of the foot is irregular in its shape. The best way is to compare with the old shoe, or to draw a model on paper of the sizes required.

4. The web should be twice as broad as the wall of the hoof is thick; about 20-24 m.m. for our ordinary farm and army horses; the thickness equal to half the breadth of the web, 10-12 m.m.

5. As regards the fullering, number and position of the nail holes, I would refer to the principles of shoeing. The average thickness of the average hoof wall is 10 m.m. The holing is satisfactory when the inner edge of the nail hole, in the different sizes, is 8-12 m.m. from the outer edge of the shoe, upon its upper surface. The holes of the inner quarter must be made 1-2 m.m. finer.

6. The hoof surface must be absolutely level.

I hold that seating upon the hoof-surface is good.

7. Caulkins should not be present, but a clip at the toe should be.

In winter, roughing nails or screws are easily fixed to machine-made shoes.

8. As riding horses often brush and over-reach, it is recommended that of each size there should be some brushing and some hunting shoes amongst the hind ones.

The hoof is prepared to receive the shoe according to the ordinary rules. The rasp is to be employed to level the bearing. The shoe must fit closely everywhere, even at the heels. The shoes are to be fitted cold, on the anvil. It will be chiefly a question of widening or closing the shoe to the shape of the hoof, and if required, to open the nail holes a little. Roughness of the edges and upper surface is to be corrected with a file, and shoes which are too long must be shortened, etc., etc.

I hope that the reader, after these explanations, will be convinced that there is a great future in store for machine-made shoes. Although many shoeing smiths will have to suffer for it, they will always have the fitting and nailing on to do, which can never be done by machinery; on the other hand, many other workmen will be able to earn their bread.

In conclusion, we are to be congratulated that, on the average, better shoeing and not, as many of its opponents assert, a worse shoeing, will be the result of the new system.

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## M. PASTEUR'S INOCULATIONS FOR RABIES.

In a recent series of experiments to test the value of M. Pasteur's prophylaxis of Rabies, Professor Frisch, of Vienna, inoculated sixteen rabbits by trephining. The virus used was of the third generation—that is, had evoluted in the organisms of three rabbits. Fifteen were subjected to preservative injections, one being set aside for comparison, but they all became rabid on the sixteenth day, and died on the twenty-first. Six other animals were inoculated with a preparation of the cervical medulla from a mad dog, but instead of trephinings, the virus was injected hypodermically. Three of these were subjected to preventive treatment, and the others kept as a test. None of these six animals became rabid. These experiments would seem to show (1) that rabies can be determined absolutely by inoculations of the nervous centres, in which case the preservative treatment is inefficacious; (2) that when the virus is introduced by the skin rabies does not necessarily follow. These statements have elicited a further communication on the subject from M. Pasteur. Upon examining, says M. Pasteur, the histories of those cases in which death has occurred from rabies after the preventive inoculation, it will be found that most of the victims were children who had been bitten severely about the face. In these cases the original treatment may not be sufficient, and it is now recommended that the inoculation should be hastened, in order to arrive quickly at the strongest cultures. The first day, for instance, the medullæ of twelve, ten, and eight days should be inoculated, at eleven, four, and nine o'clock. The second day those of six, four, and two days, at the same hours. The third day that of one day. The treatment is resumed on the fourth day by inoculations of eight, six, and four days. The fifth day by those of three and two days. The sixth by that of one day. On the seventh the marrow of four days; on the eighth that of three days; the ninth of two days; the tenth that of one day. Three treatments are thus made in the course of ten days, each terminating in the inoculation of the freshest virus. M. Pasteur adds, that when the wounds are not cicatrised, and when the patients have delayed, these treatments may be renewed, with intervals of a few days, for four or five weeks, and when the wounds are severe. The whole "intensive" treatment, as he terms it, may be employed in one day. M. Pasteur has submitted ten children who were bitten on the head or face, during the month of August, to this new plan of treatment, and he asserts that it is also efficacious after intra-cranial inoculation of the nervous centres of animals where the slower method fails. It will be interesting to hear what Professor Frisch thinks of the modified method. In the meantime M.

Pasteur enjoyed an ovation at the Academy of Sciences, where he was complimented by the president, who begged him to persevere in his researches without being discouraged by hostile criticism. "Go ahead," said M. Jurien de la Gravière, "and the whole Academy will uphold you in your triumphal progress." At the Academy of Medicine M. Pasteur gave a second reading of this communication, and evoked expressions of the greatest satisfaction from M. Verneuil, who is, according to the expression, in the same line of business. "To-day's communication," said the eminent professor, "has done ample justice to these dark doings (the criticisms of the incredulous). M. Pasteur can henceforth advance in the path of progress without heeding his obscure critics!"

M. Pasteur has also made experiments on dogs with a view to showing that, after inoculating them for hydrophobia by trephining, vaccination with the preventive marrow secures them immunity from the malady.

The number of patients inoculated for hydrophobia up to October 31 has been 2,490, of whom 1,726 were French, 191 Russians, 165 Italians, 107 Spaniards, 80 English, 57 Belgians, 52 Austrians, 25 Portuguese, 22 Roumanians, 18 Americans, 14 Dutch, 10 Greeks, nine Germans, seven Turks, three Brazilians, two Swiss, and two Hindoos. Of the 1,726 French patients 10 died, six of these being children. Although very few persons bitten this year in France can have kept away from the laboratory, there have been to his knowledge 17 deaths among this small minority. While, moreover, the deaths in Paris hospitals from hydrophobia have, in five years, numbered 60, and while last year there were 21, there have this year been only two, both not inoculated, besides a third not treated with sufficient intensity.

## New Remedies.

### HYPODERMIC MEDICATION.

WE are glad to call special attention to the *standard* solutions prepared for subcutaneous injection by the eminent firm of Corbyn, Stacey and Co. Prior to the introduction of these solutions, in the absence of the original label, one was often troubled to remember what the strength of any given solution really was, for each drug-house had its own ideas as to strength, and the hypodermic doses of the various solutions ranged from ten minims to two or three drachms—a most inconvenient quantity to inject under the skin or into the substance of a muscle.

The solutions made by Corbyn, Stacey and Co., are all standardised at thirty minims for the medium dose, a departure that will at once recommend itself to the profession, if only on the score of economy, portability, and convenience.

Accompanying each bottle of injection is a circular, giving directions to those who need them for the use of the hypodermic syringe, a full list of injections and their uses, and copious extracts from the very able paper upon Hypodermic Medication recently read before the Lancashire Veterinary Medical Association by Mr. Gartside Mayor, F.R.C.V.S.

### HAZELINE.

HAZELINE is the active principle of *Hamamelis Virginica* (Linn.), the American witch hazel, and is a clear, transparent, watery-looking fluid, of a pleasant odour, and possessing a slightly sweet astringent taste; it is absolutely free from poisonous or irritant properties. Attention has already

been directed to it as a valuable and comparatively inexpensive remedy in veterinary practice by Mr. Nunn ("Veterinary Journal," August 1886), and the additional information we have received regarding it, induces us to give it a special notice, in order that it may obtain wider use. The drug (sometimes designated Hamamelis) is in its effect anodyne, sedative, cooling, antiseptic, styptic, and hæmostatic. It is used externally for bruises, sprains, wounds, inflammations, soreness, and lameness, and greatly relieves pain. Nunn lauds it as a dressing for wounds and ulcers, when slow in healing, or when there is much loss of skin. In hæmorrhages, external and internal, it has been employed very successfully. For simple ophthalmia it has been highly extolled, as well as a wash for sore mouth; while for sore throat, bronchitis, and even pneumonia, when inhaled with steam, it is reported as affording much relief. We trust our readers will give it a trial, and thus be the means of adding one more useful drug to the list.

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## THE DURAPLASTIC COATED HORSE-BALL.

MESSRS. WYLEYS & CO. have introduced a description of horse-ball which appears to possess several notable advantages which should commend it to veterinary surgeons. These advantages are related to its shape, coating, and the solubility of this coating. The shape is exactly that of an elongated conical shot, which gives it the fewest possible points of resistance to entering the pharynx and œsophagus, enabling it to pass easily into the stomach, and reducing to a minimum the possibility of accident. The coating is on Fletcher's patent principle, and being absolutely air-tight, the therapeutic properties of the remedies it envelopes remain unimpaired for any length of time; while the ball is kept sufficiently firm to retain its shape, and is yet pliant enough to adapt itself to the fingers during administration. In addition to this the coating is so soluble that it dissolves in less than two minutes at the normal temperature of the viscera, whereby the prompt action of the medicament is ensured, a point of much importance in urgent cases. The elegance and form of the bolus is in striking contrast to the old-fashioned paper-covered article, with its flat angular ends, and its too hard or too soft consistency.

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# Proceedings of Veterinary Medical Societies, &c.

## ROYAL VETERINARY COLLEGE.

(*Continued from page* 354.)

B. *Place and opportunity.*—In the carrying out of all education, general or special, the question of facilities as to place, opportunities, and arrangements occupies a prominent position. In the institution into which you have now entered, its fulness and completeness of arrangements, together with the willingness and alacrity which our governing body have ever exhibited to adapt these to the requirements of the public or professional demand, confer upon it a character and tone fully in keeping with the present day requirements. Within the walls of the Royal Veterinary College not only are the educational needs and requirements of the student attended to, but his personal convenience and comfort as a member of a liberal and educated brotherhood have received consideration. In the curriculum of study, the present arrangement has been carried out by giving a careful consideration first to those sciences upon which medicine is founded and built up, and second to

the means by which a full practical knowledge of your professional work may be obtained. Through the studies of the former of these divisions you will obtain a glimpse into the world of pure science, calculated to develop your intellectual faculties and give to life a zest by cultivating all that is purest and best in you. The chemist will tell you much which is interesting and valuable respecting the chemical and physical laws which regulate common and every-day phenomena, which to the uninitiated are simply a series of marvels, and upon which the composition and stability of the material universe is built. The botanist will unfold to you much of the marvellous structure and activity of plant life, and I hope will awaken in you an interest in the gorgeous garniture of earth, the flowers of the field; while the anatomist and physiologist will describe to you the more wondrous and interesting structure and phenomena of the animal body, an understanding of which involves many difficult questions in chemical and physical science and underlies the most profound questions in philosophy.

Now, my young friends, I am aware that some of you may see neither beauty nor utility in some of this teaching. In such an estimate, allow me to tell you, you are entirely wrong. Apart from the disfavour with which every thoughtful man views the tendency so often exhibited in all education, so-called, to teach and to learn only up to the standard of some examination test, remember that the course of your studies has been framed by more experienced and wiser heads than yours; and that for one reason why such and such a subject should not be learned, there are, for aught you know, ten equally cogent reasons why it should. I am well aware that to creditably carry through your work your energies and time will be fully taxed; so you may depend upon this, that duties will not be laid upon you which are unnecessary, or which you are not able to perform.

To the work of the other division of the curriculum, that to which the former directly leads and in which it culminates and is chiefly valuable in so far as it secures it, viz., the means by which a full practical knowledge of your professional work may be obtained, I particularly direct your attention. If there is one thing more than another to which the attention of the authorities of this institution has been in an especial manner directed, it is this of rendering the training practically useful. With a good infirmary well arranged, a large examination and out-door practice, part of the latter conducted by the students themselves under the superintendence and direction of their teachers, there is an ample field for obtaining that clinical knowledge and experience without which no mere scientific training is capable of fully equipping anyone for the duties of active life. And I would particularly desire to bring it under your attention that the demand and need for this character of training is likely to increase. By the Veterinary Surgeons Act of 1881 the race of self-educated medical attendants on animals is likely steadily to decrease or become extinct, while, should the qualified veterinarians who must succeed them not satisfy the public, who are their employers, there is a danger that the chief provisions of the Act may require to be rescinded.

c. *Teachers.*—I will not offend your sense of propriety at this time by any attempt at praise of the instructors connected with this school. I will leave that for others, only premising that all are actuated by the highest motives and an earnest desire to further the interests of those who attend their instruction. As respects the system of teaching, that generally adopted throughout the different classes is a mixture or compound of lecturing with tutorial instruction. Whatever may be urged against the former system it has certainly much to recommend it over that of acquiring knowledge from books only. There is certainly fascination and power in the person and voice of the teacher to the great majority of men which is not exercised by books. The lecture in its highest form presupposes a vast amount of work

on the part of the lecturer, it appears as the result on his part of much reading and observation undertaken for the purpose of obtaining the views and experience of others which he must, together with his own, condense or amplify for the benefit of his audience. "In the orally delivered lecture there is light and shade. The voice and the manner of the lecturer will do more than any tricks of style can do. *Emphasis* is better than *italics*. The human voice can recall the wandering attention, while the printed word has no such means of self-assertion." With all of us there is likewise the possibility, if we possess enthusiasm ourselves, of exciting interest and enthusiasm in our subject in others by virtue of the power of personal contact and of sympathy. This is what many students will acknowledge some lecturers possess when handling even the driest subject. Books no doubt may do the same, but personal contact is more likely to do so. It is thus that teaching by hearing must ever possess a superiority over teaching through sight. The former is both more common and more forcible than the latter.

Our endeavour as your instructors will not merely be to excite interest and enthusiasm in you in the subjects which we teach, not merely to act as guide or sign-posts pointing the way in which you should go, but to see that you are directly placed on the road and safely started on your journey, and to take you to wider and richer fields of thought.

No results of this character, however, will be attainable, and the ultimate end of your desire and enrolment here will be as far from attainment as ever, unless you yourselves provide such material or qualifications as—A. *Earnestness in work.* B. *The exercise of observation and reflection.* C. *A proper observance of all social relations.*

A. *Earnestness in work.*—I desire to tell you that as the result of the experience of all men in every age of the world—and "history is but philosophy teaching by facts"—that however good your capacities, whatever time and opportunity you may possess for work, and however able and qualified your instructors may be, all will be thrown away as respects ultimate results unless you yourselves, the individuals who have to be instructed, are in earnest in your pursuit of the knowledge required. It is no half-hearted efforts, working by fits and starts as the spirit or necessity moves you, that will accomplish your ends, but a steady, dogged perseverance, working steadily, continuously, and according to method. All this, recollect, is not incompatible with a fair amount of play or recreation; the occasional relaxation of energy gives to it a greater force when in application. Let none of you presume on your superior ability and power to overtake work; remember the fable of the hare and the tortoise. It is not so much brilliant talents which will secure the prize, but conscientious and earnest use of moderate ones. The biographies of the greatest and the most successful in every walk of life will teach you that it has not been those who started with brightest prospects of success, either on account of talents or opportunities, who have been most successful, but those who have been most in earnest in all that they undertook. Difficulties which discourage and overpower the lukewarm only act as stimuli to the man who is in earnest. All of us, I fear, regard too meanly the strength and the philosophy contained in the saying, "Where there is a will there is a way."

B. *Observation and reflection.*—By the first you gather material as animals do food with the organs of prehension; by the use of the other you act upon the facts collected, as in digestion the food taken into the body is prepared, assimilated as it is called, and made part of the organism itself. There is little doubt that in no science more than in the study of medicine is the act of recognising and noting phenomena a matter of importance. You must recollect that you are entering upon the study of a science which is more truly based upon induction than deduction,—that all your advances must pro-

ceed from the particular to the general, not from the general to the particular. In the present day there must be no forming of theories and manipulation of facts to suit these theories, but rather through assiduous collection of facts to rise to the recognition of those general truths which to us are as first principles. Although it may be doubted whether it is strictly true that to observe facts is as high an effort of intellect as to conceive thought, there can be little doubt that in the study of medicine it is very difficult to over-estimate the value and importance of correct observation. Do not, however, forget that facts of themselves are of comparatively little value until brought into contact and operated upon by mind. "Some men read too much and think too little, the consequence of which is they make less of what they do read and observe than if they read less and thought more. Before entering upon any course of study there is need of healthy hunger. Thinking is related to reading and observing much as digestion is to food. The majority of men never think at all; thus the open mysteries of nature are to them manifold."

c. *A proper observance of all social relations.*—Over the temples of religion, of science, and of art in a neighbouring country, you will find inscribed "*Liberty, Equality, Fraternity.*" Now, whatever ideas our brilliant friends may associate with these terms, I am disposed to think that in our present mundane condition a truer estimate of our social relations, and one calculated to result in the production of a stronger individual and national character, is that which is embodied in considering these as bearing upon our fellow-men as *superiors, inferiors*, and *equals*. First of all, I counsel you young men to be sober-minded, seeing that should you survive twenty years hence there is little doubt that you will feel satisfied that you know less than many of you imagine you do at the present moment. Cultivate the old Spartan virtue of reverence for those who are older than yourselves, and who from their experience of life are likely to possess a juster estimate of it than you are capable of doing. Your teachers, both by virtue of their experience and their special knowledge, demand your respect in word and act. Never doubt that we have your best interests at heart, and while we do not ask you to understand all that we may advise you to do, we do, however, ask you to trust us. As no one lives entirely for himself, and as all while living must influence many with whom they come in contact, see that this influence be of a wholesome character and such that a review of it in after-life may not give you pain but pleasure. Lead no one of your fellow-students to do or to say what you would consider undignified or unmanly to do yourselves, treat kindly individual idiosyncrasies for which the possessor may not be responsible, and let your whole deportment be courteous, manly, and obliging, so will you pass through your course with a feeling of having both received and yielded good. Much more I might say to you, but I feel that to those who are actuated by a determination to do what is right and to benefit by their entrance here, I have said enough to convince them that their student life is something more than one long holiday, while to others, if there are any such here, I fear that any more which I might add would only provoke a smile of indifference or incredulity.

In conclusion, my young friends, remember that you have a duty to perform to your parents or relatives who have placed you here and given you the opportunity of acquiring knowledge,—a duty to yourselves which, if neglected, can never be recovered,—a duty to your teachers and the public. These will joy in your success and grieve for your failure, for they regard you as the inheritors of the work of those who have gone before you, and they look to you as the representatives in the future of an honourable and useful profession.

> We live in deeds not years; in thoughts not breaths;
> In feelings, not in figures on a dial.
> We should count time by heart throbs. He most lives
> Who thinks most, feels the noblest, acts the best.

The CHAIRMAN: It is now my pleasing duty to ask you all to give a very hearty vote of thanks to the Principal for the eloquent and able address to which we have just listened. I hope I shall not offend the modesty of Professor Robertson if I pay him an indirect or abstract compliment by congratulating him on what he has himself called the associated life of this Institution, upon having the principal's ability and experience devoted to its service. (Cheers.) As one of the Governors, too, I should like to thank the Principal for the kind words he spoke of the governing body, and fully to endorse the tribute which he paid to the lecturers and assistants who are associated with him in the arduous duties of training the veterinary students. Perhaps now I may be permitted to say a few words on the general prospects of this Institution. At the opening of your session last October your chairman, Lord Arthur Somerset (cheers), noticed a consideration which I am sorry to say thrusts itself very often unpleasantly into public and private affairs alike, that is the consideration of funds. "The subscriptions," Lord Arthur Somerset said, "do not increase as I should like." Well, gentlemen, in view of the purposes of the Royal Veterinary College the governing body must always feel anxious about the income derived from subscriptions, for at the hazard of your all laughing at me for talking of what I know nothing about, and also at the hazard of being accused of plagiarism of a past Prime Minister, I will call the subscription income, the motor muscle of the governing body. (Laughter.) We see much we wish done, we see much which could be done, with results favourable to society and to humanity at large, but these visions of enlarged benevolence and beneficence are so dependent for actual form and shape upon funds not at present at our disposal, that the merest outline would at present be waste of time. I will, however, take this opportunity of assuring you that the governing body are most anxious to add to the scope of the Veterinary College. We do not wish to fall away from, or to cease from prosecuting the progress of the last quarter of a century. We feel that we owe a duty to students and to practitioners of every means in our power to promote their intellectual opportunities, and to notice and encourage their scientific investigations. Beyond that we owe a further duty to society at large. Let any intelligent observer only consider the immense capital centred in domesticated animals in the United Kingdom, and the profit and loss arising from their sanitary condition, and those considerations which legislation has recently recognised, and he will at once see the great economic interests which are bound up in the thorough and far-reaching education of students of Veterinary Science. (Cheers.) Well, gentlemen, I hope that the public will prove not only an intelligent observer, but a generous observer. The governing body are making special exertions to catch his attention, and bring to his somewhat pre-occupied notice the claims of what we consider to be a most valuable and industrious public institution. That, gentlemen, is the general ground upon which we approach the public, the ground of universal advantage and utility. But at the same time we shall approach him on his most accessible and acutest side, the ground of some individual advantage and profit which he will derive from becoming a subscriber to this Institution. These advantages including as they do, veterinary examination, hospital treatment, advice, and analysis free of charge, and conducted by eminent members of the veterinary profession, are by no means insignificant, and I really think cannot but commend themselves to the many gentlemen keeping horses in London, and who must be aware from sad experience of the extreme susceptibility of horses in London stables to feverish ailments and influenza, generically styled by stablemen "amiss." I hope, gentlemen, that before the next session we may be able to welcome many new subscribers, and I think

that the objects and advantages of the Veterinary College have only to be more widely known to be more fully appreciated and generally recognised.

I hope you will not consider it a presumption on my part if I say a word of congratulation and encouragement about your future life-work; of congratulation, for I venture to think that every day's experience tends to add to the importance of your calling, and to interweave it with the health and wealth of our national life. Of encouragement, for I feel, and I think Professor Robertson has proved it to demonstration, there is yet much to achieve. You need never repine or slacken in a conviction that the last word has been said before you have a chance of saying anything. Possibly some present here to-day may be destined to utter the first words on some branch of science or pathology. At all events, it is impossible that any of us here to-day will hear the last words or witness the last steps of scientific veterinary progress. Now, I think, this is an encouragement. In the history of most learned professions there is hardly anything at this advanced stage which is not comparatively old. In the history of the learned profession you are entering upon there is hardly anything which is not comparatively new. Since 1885 much has been attained, but the race of explorers is surely not extinct. There are still many anomalies to reconcile, many difficulties to unravel, and many analogies to establish. Thirty years ago the continent of veterinary science, as we now understand it, was a dark and undiscovered country; its borders even now are still misty, and what we may call its scientific frontiers comparatively undefined and unobserved. You have before you a wide horizon, and, I think, there must be many here who are fully determined to take advantage of it. I will not detain you longer, but I will wish you much success in your studies here during this session as may renew daily your determination to lead useful and devoted lives. (Loud cheers.)

The PRINCIPAL: My Lord and Gentlemen, first of all I thank you for the very flattering way in which you have received the address. I will next ask permission to read the list of prizes and certificates granted in this School.

## LIST OF MEDALS, CLASS PRIZES, ETC., AWARDED AT THE OPENING OF THE WINTER SESSION, 1886-87.

### COLEMAN PRIZES.

| | |
|---|---|
| Silver Medal ... ... ... ... | Mr. F. Warren. |
| Bronze Medal ... ... ... ... | Mr. R. Lord. |
| Certificate of Merit ... ... ... ... | Mr. T. H. Hobson. |

### CATTLE PATHOLOGY PRIZES.

| | |
|---|---|
| Silver Medal ... ... ... ... | Mr. P. G. Bond. |
| Certificate of Merit ... ... ... ... | Mr. F. Warren. |

### SCHOLARSHIP.

| | |
|---|---|
| £25 per Annum for Two Years ... ... | Mr. D. B. Miller. |
| Very Highly Commended ... ... ... | Mr. W. A. Byrne. |

### CLASS PRIZES.

*Class C.*

| | |
|---|---|
| Hippopathology ... ... ... ... | Mr. E. A. West. |
| Cattle Pathology ... ... ... ... | Mr. F. Warren. |
| Morbid Anatomy ... ... ... ... | Mr. F. Warren. |
| Helminthology ... ... ... ... | Mr. J. D. Roberts. |
| Therapeutics ... ... ... ... ... | Mr. F. Warren. |

*Class B.*

| | |
|---|---|
| Anatomy ... ... ... ... ... | Mr. E. R. McHugh. |
| Histology ... ... ... ... ... | Mr. T. A. T. Hutton. |
| Physiology ... ... ... ... ... | Mr. J. A. W. Dollar. |

*Class A.*

| | |
|---|---|
| Chemistry and Toxicology... ... ... | Mr. E. P. Collings. |
| Materia Medica ... ... ... ... | Mr. W. H. Bush. |
| Practical Chemistry... ... ... ... | Mr. W. A. Byrne. |
| Botany ... ... ... ... ... | Mr. W. A. Byrne. |

The PRINCIPAL, having read the list, said: Before resuming my seat allow me to ask you to accord a hearty vote of thanks to our noble chairman for his services here to-day. I ask it the more readily because I am well aware that to such as his lordship these duties are often carried out at considerable inconvenience, and when carried out always point to the existence of that which is so dear to the heart of every true Englishman, a consciousness and appreciation of the calls of duty. (Cheers.)

The CHAIRMAN: Mr. Principal and Gentlemen, I can only thank you for the vote of thanks which you have been kind enough to accord to me for what I feel to be the very insignificant and slight service I have given to-day. I am sure it has been a very great satisfaction to me to be here to-day and to do anything in my power to further the interests of the Royal Veterinary College.

The proceedings then terminated.

## WESTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

(*Continued from page* 370.)

I remember well being called to see a Guernsey cow two years old, a few days after she had calved; she did not appear to be in a serious state, but had lost her appetite, was languid, stiff, lay about, her temperature was high and pulse feeble. I inquired at first if the placenta had all come off, and was told "the owner was sure the cow had cleaned properly," consequently, I did not search her, as I generally make it a rule to do; I treated her for debility and a rheumatic chill, but could make no progress towards a cure; in fact, she was only kept alive for about ten days by what was put into her artificially in the way of gruel, ale, and the medicinal agents.

On making a *post-mortem* examination, I found about four gallons of putrid viscous fluid remaining in the uterus, which undoubtedly caused death by blood-poisoning. Since this, I have always made it a practice in every occult case soon after parturition to search and make an examination of the uterus.

These cases are most common in mares from debility of the uterus after hard and protracted cases of foaling. The first case I ever saw, the farmer told me it had taken many hours and the assistance of several men to get off the foal, and he had treated the mare himself for about a week. I found the mare as stiff as I ever saw an animal in a most acute case of Laminitis, but the legs were extended like trestles, there appeared to be no flexion in the joints, perspiration was streaming from the skin, as in a case of confirmed Tetanic Spasm, the pulse was about 120 per minute, and there was a most anxious look about the countenance. I immediately searched the uterus and found a quantity of putrid fluid therein; this I evacuated and cleansed the parts with warm water and Condy's fluid; but I was too late, and a painful death took place the same night.

The next case of a serious character (I often see such instances in the early stages), was of a blood mare, belonging to the largest breeder of thoroughbred stock in Devonshire. She was in a similar state to the last, but not quite so far advanced; about three days after foaling, very stiff, profuse perspiration, loss of appetite, constipation, inability to move, etc.

I evacuated about three pints of the same kind of fluid from the uterus, syringed the parts out clean with a Read's pump and warm water containing a small quantity of Condy's fluid every day, gave gruel and ale to compensate for loss of appetite, and administered salicylic acid dissolved in spirits daily, with one or two doses of sulphate of magnesia, until the bowels became normal and the feverishness subsided; then, when the appetite returned, I administered tonics, and dieted her on cut-grass, bran, and oats. The mare quite recovered, and has had a living colt again this season. The same owner had another case of a mare this season, but detected the symptoms earlier, and she was well in a few days. I always use the water as near the temperature of the animal as possible—about 100° F.—for injection, having known a novice use cold water after seeing me operate on a case, which chilled the animal internally, and it died a few hours afterwards. I have found 2 oz. doses of hyposulphite of soda daily of great service in discharging the placenta from cows, combined with tonics and given with gruel and ale, or stout in obstinate cases, which, if not treated judiciously, will terminate fatally in numerous instances.

Dead puppies are the most common cause of blood-poisoning in bitches, and inability to discharge their young is not an unfrequent cause of the same effects in the sow. The same principles of treatment must guide us in the smaller as in the larger animals. We know what Nature requires in a normal state, and we must endeavour to assist her to the best of our skill and power. Then, if we are sent for at all within reasonable time, there is no reason why a cure should not be effected in the great majority of instances, and in a corresponding degree will the man of scientific attainments be valued by the public before the empiric.

The PRESIDENT remarked that it was curious to observe how different species of animals exhibit widely varied symptoms in cases of retention of the placental membranes. The cow would sometimes retain the membranes for days without showing scarcely any signs of ill-health, whereas, if the true placenta of the mare was retained only for twenty-four hours, it might be attended with the most serious consequences. He had treated several very bad cases of Pyæmia in foals when born of mares suffering from Strangles, large abscesses forming in all parts of the body. He hoped we should have a good discussion on Mr. Heath's paper: it contained matter of a highly practical character, and it touched on cases which were of the highest importance to the every-day practitioner.

Mr. OLVER'S attention had lately been called to an undoubted and remarkable case of Blood-poisoning in cattle. A cow was the first animal to die with all the symptoms of Blood-poisoning; and within a week four more cows died. He carefully examined the water, and found it warm and stinking; by tracing it up to its source, he found it became contaminated with the sewage of the house. Proper sanitary precautions were taken, and no more deaths occurred. It was strange that animals generally preferred drinking filthy and stagnant water rather than pure. Where cows were neglected after calving, it was not unfrequent for them to die from Blood-poisoning due to retention of the membranes. He preferred the sulphite of soda to to the hyposulphite, for cattle would more readily eat the former with their food.

Mr. COLLINGS said it was fortunate that retention of the placenta was rare in the mare when compared with the cow. It was always a serious calamity

to a mare if much went amiss with her at the time of parturition. Great care should always be taken with punctured wounds to keep the external orifice well open, otherwise there was imminent danger of the imprisoned pus becoming absorbed, with Pyæmia as a result. A fatal case of this character had lately occurred in his own practice.

Mr. W. PENHALE, jun., said his attention was called some time since to a mare, which was walking with a peculiar stiff gait, and showed several other symptoms of Blood-poisoning, beyond which there were slight labour-pains. On his introducing his hand into the womb, he found it to contain twin foals in an advanced state of decomposition. After some difficulty we removed them piecemeal, the stench being almost unbearable. The mare made an excellent recovery, beyond the stiffness, which never quite left her. A decomposing fœtus was much oftener found in the uterus of the cow and sheep than in the mare. In retention of the membranes we always gave tonics, and found antiseptic injections most successful, but before resorting to the latter, care should be taken to observe that the patients did not suffer from a ruptured uterus.

Mr. HEATH, in replying, said he thought it better not to interfere with the membranes of a cow until the fourth day after calving, they should then be removed at once. When death occurred in these cases, he believed it to be generally due to decomposing fluid in the uterus.

Mr. COLLINGS proposed, Mr. OLVER seconded, and Mr. W. PENHALE, jun., supported a hearty vote of thanks to Mr. Heath for his valuable paper, expressing a wish that he would allow it to appear in the veterinary publications.

Mr. HEATH suitably replied, thanking those present for the attention they had given.

The PRESIDENT entertained the members to an excellent dinner, after which the usual loyal and association toasts were duly honoured, Mr. J. A. Collings acting as an efficient dinner-steward. It was resolved to hold the next meeting at Exeter, in March. WILLIAM PENHALE, *Hon. Sec.*

## SOUTHERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE quarterly meeting of this Association was held at the Royal Kentish Hotel, Tunbridge Wells, on September 29th. The chair was taken by the President of the Association, Mr. J. Barford, of Southampton; and those present included Professor Axe, of the Royal Veterinary College; Mr. E. A. Hollingham, Tunbridge Wells, Hon. Sec.; Mr. F. W. Wragg, London; Mr. P. Gregory, Tonbridge; Mr. Cawthron, Hadlow; Mr. Rock, Chelsfield; Mr. Stock, Lewes; Mr. G. B. Martin, Rochester; Mr. H. Hogben, Folkestone; etc.

The HON. SECRETARY read the notice convening the meeting, and also the minutes, which were duly passed and endorsed by the President. The Secretary also announced that letters regretting their inability to attend had been received from various well-known members of the Association. Mr. Frank Warren, of Hadlow, was also proposed and seconded as a member.

A short discussion then ensued with reference to the financial position of the Association, Mr. Wragg bringing forward the question as to whether it would be advisable to have a fund for the purchase of instruments, for the benefit of the Association generally, and the Secretary pointing out that if only the outstanding arrears of members' subscriptions were paid up they would stand in a very good position.

It was proposed by Mr. WRAGG that those members who were in arrear should be communicated with by circular, Mr. MARTIN, who seconded this

proposal, expressing his belief that they would readily pay up if their attention were called to the matter, but they were a little apathetic. Eventually it was decided to leave the matter in the hands of the Secretary, who undertook to communicate with the members referred to as from the Association, the question as to the fund for instruments being allowed to stand over.

The PRESIDENT moved that the thanks of the Association be expressed to Dr. Fleming in recognition of what he had done for it, and that he be made an honorary associate ; this being seconded by the Secretary, and carried unanimously.

Professor AXE then proceeded to deliver a very valuable and instructive lecture, which was listened to with great interest by the members present, the subject, as announced, being, "Experiences of Lithotomy and Lithotrity by medio-perineal Section," and the speaker's remarks being illustrated by diagrams, and the production of various instruments required for carrying out the operation.

At the conclusion of the address, which was received with applause,

The PRESIDENT observed that they would all feel very thankful to Professor Axe, who had attended at some inconvenience to himself, and had given them a most interesting address on a subject in regard to which he must confess that he himself, and he believed most of those present, had not had a great deal of experience. Should any gentleman have had a little experience with reference to it, he trusted that he would give them the benefit of it, and he might mention the case of Mr. Wragg, who, from what had been said by the lecturer, appeared to have recently had an operation of this nature.

Mr. WRAGG said he need not tell them that he had taken a very great interest in the lecture. As Professor Axe had told them, he had a case some four or five years ago, and as it was the first case of the kind that he ever saw, he thought there might be some excuse for the penalty, which, as his friend had put it, he suffered for his indiscretion. (Hear, hear.) It was not the first indiscretion he had committed. (Laughter.) He meant professional indiscretion—further than that he would not admit anything. (Laughter.) He had often found that by a professional mistake they frequently gained more practical experience than when their case had a more happy termination. Certainly, it was so in the present instance. Describing the case, the speaker said he removed the stone very successfully, and had begun to feel rather pleased with himself, when he thought he would just examine the bladder again to see whether there was anything else in it, and he accordingly did so, by the rectum. He then felt what he took to be another calculus. Of course, he immediately inserted the forceps, and grasped this body. He was very careful not to use any more force than he could possibly help, but he found, after grasping it, and putting his hand into the rectum, that it was attached to the bladder. He came to the conclusion that it had formed a sac, so he dropped the body, took out the forceps, and let the patient up. Unfortunately, within twenty-four hours the animal was dead. The coats of the bladder were found to be so attenuated, and so very thin and tender, that he was not at all surprised that by just taking hold with the forceps in the manner he had described he ruptured the bladder. He should like to ask Professor Axe a few questions, and it had occurred to him, in reference to the forceps having teeth on each side, whether, supposing he had grasped the calculus, and its long axis was in a position across the forceps, he would be able to liberate it again ?

Professor AXE : I think I suggested that we could not turn it in the spiked forceps ; we should be obliged to have the smoothed-faced forceps for the purpose.

Mr. WRAGG then asked whether, in sewing up the wound, the suture would be put through the whole of the structure cut through?

Professor AXE: Nothing but the skin.

Mr. WRAGG: Would there be any advantage by closing the wound with a catgut suture?

Professor AXE: I think not.

Mr. WRAGG added that he thought himself there was a great deal of theory about the use of the catgut suture, and

Professor AXE observed that he used wire sutures, because they could be clipped and easily pulled out.

Mr. WRAGG said his patient died within twenty-four hours, and he would like to know the Professor's opinion as to the cause of death. He was inclined to think the animal died from Peritonitis, but on a *post-mortem* he found that the peritoneum and intestines looked perfectly healthy. Did the Professor think that Peritonitis could produce death in, he should say, twenty hours?

Professor AXE said an animal might die from Peritonitis in twenty hours, expecially when the peritoneum became inundated with urine. The question was whether there was any chronic urinal disturbance, as not unfrequently occurred with encysted (?) calculi.

Mr. WRAGG: This was a young horse, only about seven years old.

Professor AXE thought it very probable that there was some chronic urinal disturbance, rendered acute by the operation, and a certain amount of Peritonitis from urine passing into the peritoneum. It was hardly likely the animal would escape Peritonitis.

Mr. WRAGG had wondered whether it was possible to have had uraemic poisoning.

Professor AXE: "Not in the time, I should think." He went on to say that if the kidneys were in a healthy condition they would continue to secrete, notwithstanding the rupture in the bladder. If they had suffered from chronic disease as the result of the presence of the calculus, it was possible that the disease in the kidneys might have become aggravated, and death might have occurred from acute Peritonitis, added to which he did not think it would be possible to have urine in the peritoneum for twenty hours without having some peritoneal inflammation. It might not present itself as a red discoloration, but the question was, was there any exudation upon the peritoneum?

Mr. WRAGG: None whatever.

Mr. ROCK referred to a case of rupture of the bladder to which he was called, when he saw the patient about twenty-four hours after the occurrence, as near as could be judged. The animal gave no indication of pain, except by its very depressed appearance, and he could not diagnose rupture of the bladder, but he thought there was very likely a rupture of the liver. The animal died on the afternoon of the next day, and he found considerable rupture in the bladder and intense inflammation. There was a quantity of fluid among the intestines, and a peculiar flush on the peritoneum. There was very little to account for death from Peritonitis, but he took it the animal died from that cause.

Professor AXE, alluding to the presence of a diffuse flush, said they might not meet with any very pronounced redness, but that did not preclude peritonitis. The flush would not be quite sufficient to establish the existence of Peritonitis, if the discoloration was not due to bloodstaining. In reply to Mr. Gregory, he again gave it as his opinion that they might have death in twenty hours from Peritonitis.

Mr. WRAGG alluded to a case of rupture of the bladder, caused by the introduction of a stick (which was similar to the last case), and in which he

was at first inclined to think it was a case of Pleurisy. The next day the animal was much better, and her pulse fell from 80 to 45. Then Peritonitis set in, but she did not die till the fifth day.

Mr. GREGORY: Should you think Peritonitis could kill in twelve hours?

Professor AXE: I should say not, but I should think in twenty hours. There is a great shock in acute Peritonitis.

Mr. GREGORY was of opinion that in operations, such as they had been speaking of, death might be more due to shock to the system than Peritonitis. He did not think they took this point sufficiently into consideration, and he pointed out that if the horse had any weakness of the heart or of any important vessels, the shock of being thrown upon his back and undergoing the operation must tell upon him. He did not himself think that Peritonitis could kill a horse in twenty hours.

Mr. STOCK quoted a case which came within his experience at Lewes during the last three months. A horse six years old was turned out into a park, and was seen feeding over night, but the next morning he was found to have been lying down and rolling about, and before twelve o'clock he was dead. Upon a *post-mortem* he found that the horse died from Peritonitis, pure and simple. The speaker also quoted a case with reference to the urine percolating through amongst the intestines, the animal being in this instance a working ox, which had a small rupture of the bladder near the neck, no bigger, he supposed, than would permit the insertion of a quill. In this case he believed the animal died the seventh day after being taken ill.

Mr. HOLLINGHAM said there was just one matter upon which he would like to put a question to Professor Axe. It always appeared to him that when any operation was performed the subsequent treatment of the wound was really as important as the operation itself. He would like to know whether Professor Axe had found in the course of his experience that in cases, such as he had described, where the patient was suffering from severe irritation, and his treatment would be to remove the suture from the wound, and inject the bladder with warm carbolised water, a course of treatment of that kind might not produce something in the nature of a fistulous opening, in consequence of continual interference with the union of the wound. He would ask whether in cases of that kind it might not be as advisable to use occasional doses of opium, or morphia, with the view of allaying the irritation, instead of interfering with the wound? With regard to the method of closing it, would a good wax-end be as serviceable as wire?

Professor AXE replied that he should say it would be under any circumstances a bad practice, where a horse after an operation was suffering considerable pain, to allow the sutures to remain, and a bad practice not at once to resort to injection. It indicated the existence of some cause of irritation. The chances of a fistulous opening were remote, and he should not hesitate to reopen the orifice two or three times. Not long ago he operated upon a horse, and it became necessary to perform the operation three times at intervals of three weeks. It was astonishing what liberties could be taken in this way.

Mr. HOLLINGHAM: Do you not sometimes have erysipelas supervene?

Professor AXE: As in all other cases, there are contingencies which you must, of course, be prepared for.

Mr. MARTIN said the cases under consideration seemed to him very rare. He had been in business many years, but had never had an opportunity of operating on one, and they were, in fact, cases which they were unable to discuss from their want of experience, although Professor Axe spoke of them as more frequent than they had any idea of. Professor Axe was generally very explicit and clear, and he (the speaker) recollected attending one of his lectures in London, from which he learnt more on the subject treated of

than he ever knew before. However, in the present case he did not think the Professor had sufficiently described the symptoms in such cases as he had referred to, and how they were to distinguish them from other abdominal affections. This seemed to him a most difficult point. He did not think a horse ever died under his care without his making a *post-mortem* examination, but he did not think he had ever seen such a case as had been described. Having heard this lecture, he should not hesitate to operate. He had never known a horse to die from shock.

The CHAIRMAN observed that the speaker had mentioned the very point to which he was going to refer. They had heard a most interesting account of the operation of Lithotomy, as clear and detailed an account as he could wish to hear. Still, as Mr. Martin had suggested, they must remember the rule of "first catch your hare," and he thought the first thing they had to do was to be perfectly clear in their own minds that they had a case suitable for operation. Mr. Wragg might possibly recollect the symptoms which first led him to diagnose his case, and Professor Axe might give them some information on the same point. It was a very important one, and he (the speaker) had a double reason in asking the question, as he had a case at present under investigation in which he was inclined to think there was some mischief in the bladder. Speaking from personal experience, he gave his opinion in favour of Lithotomy as against Lithotrity, on account of the probability of portions being left behind in the latter case, from which circumstance, he was convinced, the result was in nine cases out of ten unsatisfactory. Although this was an operation which in general practice they did not very often meet with, the subject was a highly interesting one, and as President he tendered to Professor Axe his grateful acknowledgments for having enlightened them as he had done. Notwithstanding, he added, that he had been in practice forty years, he had never had a clear case before him, nor had he performed the operation himself. He concluded by proposing a formal vote of thanks to Professor Axe.

Mr. WRAGG, replying to what had been said as to the symptoms, remarked that attention was called to the case in which he was concerned by the animal frequently urinating. Reference being also made to the habit of an animal under such circumstances constantly shifting its position from one leg to the other.

Professor AXE observed that this was a very marked symptom in some cases. Sometimes the animal would catch the leg up, and hold it up for some little time.

Mr. HOGBEN mentioned a case of rupture of the bladder, in which the symptoms were those of collapse, the animal dying the same day. He also alluded to a case of stone in the urethral canal of a dog, in which the distended bladder could be distinctly felt through the abdominal walls.

Mr. STOCK, who had listened to Professor Axe with a great deal of pleasure, said he had been in the profession ever since he was thirteen, and had only seen one case of stone in the bladder, which was that of an old roan mare at Lewes. He found her very much emaciated—nearly a skeleton. She passed urine very many times. He found by *post-mortem* examination that the lower part of the stone was attached to the coats of the bladder, and that one end had grown through the bladder on to the pelvis, the walls of the bladder being very thin and weak just at that part. He gave the stone a tap with a hammer, and detached it, and he had it in his surgery at the present time. It weighed twenty-four ounces and a half.

Mr. MARTIN seconded the vote of thanks, speaking of Professor Axe as being at all times ready to go anywhere to deliver a lecture and give them instruction.

The vote of thanks having been unanimously carried,

Professor AXE expressed his acknowledgments, and the equal pleasure which it had given him to give them the lecture. He did not think they would care to hear him go into the whole question of symptoms on the present occasion, as it would detain them so long. In cases of this kind, it was not only a question of what they could observe, but of what they could touch. As Mr. Wragg had observed, the animal urinated frequently and in a particular manner. One of the most striking symptoms in connection with encysted (?) calculus was that the animal while at rest in the stable would possibly not manifest any evidence of disturbance, but as soon as he was submitted to exercise his condition was shown by passing bloody urine. The calculus excoriated the bladder, and produced bleeding. He thought that was the most diagnostic symptom there was, apart from the physical touch of the calculus through the rectum, which was not always possible. (Applause.)

This concluded the discussion, and the meeting then terminated, with a suggestion for holding the next gathering at Lewes, the President stating that he had already secured another distinguished professor to give them a paper upon that occasion, Professor Brown, of the Privy Council Office, having said that he would be very pleased to give them an address upon some suitable subject at their March meeting. (Applause.)

Business then gave way to social enjoyment, the members present dining together at the same hotel, and spending a very pleasant hour or so ere they separated for their respective destinations.

## YORKSHIRE VETERINARY MEDICAL SOCIETY.

THE last quarterly meeting for the year was held at the Queen's Hotel, Leeds, on Wednesday, 27th October, the President, Mr. Benjamin Smith, in the chair. The following members were also present, viz., Messrs. J. S. Carter, Anderton, J. M. Axe, P. M. Walker, Bell, Toope, Greenhalgh, Pickering, Mason, and the secretary. Messrs. M. Smith and Hanson were present as visitors. Apologies for non-attendance were received from Professors Williams and Axe, Messrs. Dray, Danby, Bale, Coopers, Greaves, Hodgman, Naylor, Pollard, Snarry, and Chambers.

The minutes of the previous meeting were read and confirmed. Mr. Greenhalgh nominated Mr. A. E. Hanson, Norwood-green, near Halifax.

Mr. AXE exhibited an interesting specimen of fractured Os. Naviculare. A fine carriage horse, five years old, the property of Lord St. Oswald, Nostell Priory, was put into harness, one day, two years ago, when, starting the carriage, he made a terrific plunge, and came down with great force, and was found to be lame in a fore leg. Mr. Axe treated the horse for an injury to some structure within the hoof, and, although the lameness was much improved, he still went lame at the end of four or five months after the injury. When Mr. Broughton examined the horse in conjunction with Mr. Axe, they arrived at the conclusion there was a fracture of the coronal or pedal bone; the horse, having sustained a fractured limb, was destroyed, and, upon examining the forefoot, a perpendicular fracture, right through the middle of the navicular, was discovered, together with the structural alteration of the joints, attendant upon such an injury.

Mr. TOOPE introduced the subject of the fees payable to Veterinary Inspectors in the West Riding of Yorkshire, the acting justices having recently lowered the rates of payment. After some discussion, a resolution was unanimously passed, "That, in the opinion of this meeting, the action of the executive, in lowering the scale of the fees payable to Veterinary Surgeons, is very unnecessary and exceedingly unjust, and that a meeting of the Veterinary Inspectors of the West Riding be called to consider the matter."

Mr. P. M. WALKER then gave a very interesting paper on his new system of ventilating buildings, rooms, &c. He entered into the defects of ventilators hitherto introduced, as ventilating only their own column and creating draughts. He finds experiments do not justify the notion that heated vitiated air passes up one side of a shaft, and fresh cold air comes down the other, a notion that has long been prevalent in this part of the country. The principle of Mr. Walker's system is securing a plentiful supply of fresh air within the building, by conducting and diffusing it, through his patent diffusers, in such a manner as to prevent draughts. He demonstrated to the audience his several systems of diffusion, which were considered by the members present to be highly satisfactory.

Mr. GREENHALGH, Treasurer, gave the usual financial statement, which showed a balance in hand of £52 9s. 2d.

The election of officers for 1887, resulted in Mr. Geo. W. Carter being unanimously chosen as President; Messrs. B. Smith, ex-President, P. Toope, and Snarry, Vice-Presidents. The Treasurer and Secretary were re-elected.

A unanimous vote of thanks was awarded to the President for his efficient services during the year.

## MONTREAL VETERINARY MEDICAL ASSOCIATION.

AT the meeting of the Montreal Veterinary Medical Association, October 28th, Prof. T. Wesley Mills occupied the chair, and after the election of about twenty new members, and the communication of a case of ruptured bladder by Dr. Baker,

Professor McEachran delivered an address on "Some Remarkable Features of Pleuro-pneumonia." In the course of his address the doctor said:—As you are aware the past summer marks a very important epoch in the history of pleuro-pneumonia on the North American continent, existing as it has done for over forty years in some places in the Eastern states, where it has time and again been stamped out and re-imported. Notwithstanding the numerous warnings which have been given from time to time by various members of the veterinary profession and others interested in the prosperity of the vast cattle industries of the United States and Canada, this fell destroyer has been allowed to gain a foothold in the greatest cattle centre in the world, viz., Chicago—and worse still, from two to five years have been allowed to pass without any action being taken with a view to stamp it out, or at least nothing sufficiently effective to have accomplished the object. I have so frequently brought this subject before this association and the public that it is unnecessary for me to occupy your time with any description of the disease or the ruin which invariably follows its introduction into a country, but will at once call your attention to the following remarkable features of it, which should be known by every member and prospective member of the profession. First, this disease has no analogue in human or veterinary pathology; it is a specific disease peculiar to cattle. It is one of those plagues which spreads from one animal to another by means of a specific but undetermined virus. It is true that like everything else in this world this virus must have had a period in its history whence dates its origin, but when or where we know not, for in every instance in modern times its history in a country or district of a country has been traceable to contagion; it is true, however, that the direct source of contagion has not always been free from obscurity. The exact pathology of the disease is far from being perfectly understood. The term pneumonia would lead us to believe that it was inflammation of the lungs. This view I do not think tenable. The marked localization of the diseased centres which characterize it, the pronounced sero-albuminoid character of the exudation, which we find infiltrating the tissues

of the parenchyma and interlobular spaces of the lung, the extraordinary hypertrophy of the pleura covering the diseased lung, and above all the very plastic material which we find uniting the pleura of the lung to that of the ribs, resulting in adhesions so strong that the lung tissue will tear before they give way, are not seen in any ordinary inflammatory processes. The disease not only shows a marked tendency to localization in certain spots in the lung, but we find almost invariably that in early stages of the disease one lung only is affected, and that the left one, commencing generally in the lower lobe, to which it is often confined. In protracted cases the whole lung may be involved, and often both, but the right one less affected than the left, and the pathological lesions always less advanced than in the left one. The professor then gave a history of the outbreak of the disease, in several cases showing its nature and the time it took to develop, and detailed the result of the *post mortem* examination of the animals slaughtered. Continuing, the lecturer, speaking on inoculation, said:—"On this important question, time does not permit me to enter at length to-night; suffice it to say that in every country in the world where it has been impartially tried and reported on, the report has been unfavourable. It is not only a useless, but a dangerous practice, not only in districts where the invasion is new and limited, and it is not warranted by any known benefits. Many die from the operation itself and wherever it is practised, it has to be kept up; thus in large dairy byres in Scotland, in Glasgow and Edinburgh, where the lives of the cattle are protracted by inoculation, every fresh animal taken into it has to be inoculated; hence we have a constant supply of the virus existing and kept active in these centres of disease. It is bad enough thus to perpetuate such a disease in countries where it has gained a foothold. Yet I wonder that the agriculturists of these countries have not long ago risen as one man to demand that this iniquitous practice be made illegal. It is as incumbent on the Government of Great Britain to do this as it was to make inoculation with small-pox virus illegal. What then would we say to those who would propose such a practice to save the lives, if possible by that means, which I doubt, of a few cattle, no matter what their value might be, in a country free from any taint of the plague? Language strong enough cannot be found to denounce the suggestion. Knowing as we do that the so-called recovered (I use the term "so-called" because I do not believe perfect recovery of the lung is possible from this disease) and the inoculated cases are the secret sources of dissemination of contagion in this disease, and those occult outbreaks, properly traced up, would be referable to a recovered or an inoculated case. Those of you who desire to learn the experiences of European countries, as well as Australia and the United States on inoculation, will do well to read an able *résumé* of the same by Dr. Salmon, chief of the Bureau of Animal Industries, at Washington, in his annual report for 1885, which he concludes by these words: "From a careful study of the whole subject of inoculation for pleuro-pneumonia, we conclude (1) that this practice does not generally lessen the losses which occur from long plague infection; (2) that it is powerless to extirpate pleuro-pneumonia from any country; (3) that it can only be practised with safety to the community where the inoculated herds are kept under careful supervision, and where the inoculated animals can only leave the infected premises to go to slaughter; (4) that there is no good reason for practising inoculation in America, and it should be prohibited by law, except where the conditions just mentioned are rigidly enforced." All of which I cordially endorse, and will simply add that it is the duty of the government of every country free from the plague to prohibit importation from any country in which this cursed practice is allowed, or where medical or any other treatment is permitted to favour the prolongation of the lives of

animals which carry about centres of infection in the diseased portions of the invaded lung, for the very good reason that the most experienced inspector may fail to detect it; even three months' quarantine may not enable him to do so. In a country like Canada, where the conditions of soil and climate are such as to favour cattle raising in a remarkable degree, free from ocean to ocean from contagious diseases, our cattle increasing in numbers and in value year by year, what measure, I would ask, would not be justifiable in not only lessening the risk of importing disease, but in giving us absolute protection? In conclusion, gentlemen, I would direct your attention to the following points, viz., its contagiousness, its insidiousness, its long duration, during which its obscure symptoms are such as can only be discovered by experts, the deceptive good spirits and condition of the animals during two-thirds of its duration.

## ONTARIO VETERINARY COLLEGE.

At the commencement of October the session of the Ontario Veterinary College opened in the large lecture room of the college inTemperance Hall. There were between two and three hundred students present, and on the entrance of Mr. Andrew Smith, V.S., president of the college, all rose to their feet and cheered him enthusiastically. The class assembled to listen to the introductory lecture of the session was one of which the college may well feel proud. The students were clever, intelligent-looking men, apparently ranging between the ages of twenty and thirty-five. A majority are farmers' sons, who have already more or less practical knowledge of the handling and general characteristics of domestic animals, but whether farmers' sons or not, all looked and acted as though they had come for study and hard work, rather than the mere putting in of the time.

Dr. Smith, on taking the platform, after the storm of applause which greeted his appearance had subsided, expressed his satisfaction at meeting his old students of last year, as well as the large class of freshmen which he saw before him. In his address, which occupied about three-quarters of an hour, he gave an interesting sketch of the rise and progress of veterinary science, from its inception among the Egyptians to the present day. That portion of the address, which dealt with the history of the profession in France, England, Scotland, the United States and Canada, was particularly interesting and instructive, and was listened to with the closest attention by all present. In conclusion he pointed out in glowing terms the bright prospects which were open to the diligent and persevering veterinarian on this continent, where the field for practice was almost unlimited, only partially developed, and as yet comparatively unoccupied. He also dwelt with some warmth upon the manner in which graduates of the Ontario Veterinary College had distinguished themselves in the United States and elsewhere both in practice and veterinary literature.

The college opens this season under the most favourable auspices. The lecture rooms, and especially the dissecting room, compare favourably with those of any college in the world, while to judge from the addresses of the students, it would appear that the fame of the institution has spread all over the Continent. There are representatives not only from all parts of Ontario and Quebec (including the City of Montreal), but New Brunswick, Prince Edward Island, and the United States from Vermont to California, the delegation from Illinois being an unusually large one.

## ROYAL (DICK) VETERINARY COLLEGE.

THE opening of the winter session of the Royal (Dick) Veterinary College, Edinburgh, was inaugurated on the 27th October, by an introductory address by Principal Walley, the proceedings having taken place in the new anatomical room. Lord Provost Sir Thomas Clark occupied the chair, and there were present:—Bailie Turnbull, Bailie Cranston, Councillors James Robertson, Tait, White, Macdougald, Brown, and M'Laren; Mr. Harris, deputy town-clerk; Major-General Anderson, C.B.; Mr. Ainslie, of Costerton, Mr. Rintoul, ex-Convener Williams, the Swedish Consul, Leith, etc.

Mr. HARRIS intimated apologies for inability to be present from Sir James Gibson-Craig, Sir James Gardiner Baird, several professors of the University, and other gentlemen. There was a large attendance, including a number of ladies.

The LORD PROVOST, who was received with cheers, said they were met for the purpose of inaugurating the opening of the sixty-third winter session of the college. As they all knew, the founder of the institution was their esteemed friend Professor Dick, who was once a member of the Town Council of Edinburgh, and a most energetic citizen. He instituted the college so long ago for the purpose of diffusing a better knowledge of veterinary science, and he believed the result had been that this had been one of the most successful colleges in the country, and had done a great deal to alleviate the suffering of those animals that were so nearly attached to their own homes and to their own interests. (Cheers.) The horse and the dog were household words amongst them, and whatever could be done to alleviate their suffering, and to deal with them in a more kindly way than in former days, was a very good object indeed. (Cheers.) Within a very short time a very large addition had been, or was being made, in the college buildings. About half of the additions had been already completed, and before the end of next year they hoped they would be entirely finished, and then he believed there would be no better veterinary college in the country than this one. (Cheers.)* It attracted a body of young men from all parts of the United Kingdom, a great many from Ireland, and they were satisfied that they would go back to their own homes with a feeling that they had been going through a course of study which would be productive of the greatest good to themselves, and he was sure that all of them wished them the greatest success in their future studies and in their practice through life. (Cheers.)

Principal WALLEY then delivered his introductory lecture on "Contagious diseases of animals and the killing of animals." On rising he was warmly received by the large body of students. Before proceeding with the subject of his lecture, Principal Walley, on his own behalf, and on behalf of his

* The new buildings are a considerable way from completion, but already it can be seen that the plan on which they are being erected is of the most complete and convenient character. The anatomical lecture-room is already finished, and is a commodious, well-lighted apartment. It is fitted with a revolving table for anatomical demonstrations, and with pulleys and chains by means of which the subject to be dissected can be put in any position that may be wished. Under the anatomical room on one side of it there is a *post-mortem* room from which bodies can be raised by pulleys through a movable portion of the flooring into the anatomical room, and placed on tables for dissecting purposes. Under the other side of the anatomical room there is a macerating room, fitted with all the apparatus for boiling bones. Another room has been fitted up for the reception of rabbits and guinea-pigs, and a cage for the reception of any dog which may have bitten anyone, and is supposed to be affected with Rabies, so as, instead of killing the animal at once, to ascertain whether it is mad or not. Then there is ample stabling accommodation of the most approved kind, three rooms for dogs affected with Distemper, skin diseases, and other diseases, and a lethal chamber so constructed that carbonic gas, sufficient to poison an animal, can be obtained in a few minutes. Of course there are, besides, in course of construction, a number of other lecture-rooms and laboratories.

colleagues and students, congratulated the Lord Provost on the honour that had recently been conferred on him, more especially as he was the official head of the college. (Cheers.)

The following is Professor Walley's Address:—

In an address of this kind, it has been my usual custom to divide it into two parts, viz., into one, as affecting my pupils; into another, as of more general interest to the public. From this custom, I do not propose to depart on this occasion.

To you, gentlemen, who have already entered upon your studies, or who are about to do so, I wish, in the first place, to give a hearty welcome, and in the second place, to make a few remarks to you on growth, work, and stability. The subject has been suggested to my mind by watching the operations which have been going on within the four walls of this institution during the past few months of, to me, comparative leisure.

Since the month of July, when most of you took your departure for other scenes—either of work or recreation—the process of demolition and reconstruction has been steadily going on.

On the site of the old, new buildings have arisen, and though they have not grown so rapidly as I could have wished, they have attained such dimensions as will, I hope, render your work, and that of my colleagues and myself, during the ensuing session, more pleasant and more easy. Brick upon brick, stone upon stone have been placed, until a large part of what will ultimately be a useful and well-ordered pile has been raised, ending eventually in the completion, at least, for the next one or two decades, of a work which, more than half a century ago, had a very small begining. When Professor Dick purchased the site on which this institution now stands, his aspirations —so far as buildings were concerned—were of a very limited character; but, as time went on, he found it necessary to add to and to remodel; and the process has been continued up to the present moment. For several years past, the fact has been patent to those of us most nearly concerned, that the old buildings were totally inadequate for the requirements of modern teaching, but we were, from causes. to which I need not here refer, helpless to remedy the fault, except in a very limited degree. Various plans, as is usually the case under such circumstances, were suggested in reference to the reconstruction or rebuilding of the college, but after all had been duly inquired into, and their relative merits weighed, my suggestion that a small property adjoining the college should be purchased, and the whole of the buildings be reconstructed, was adopted. Doubtless, some advantages might have been obtained by the migration to some other and more spacious site, but there were difficulties in the way of doing this, and it was found that, by a wise utilisation of the ground at our disposal, ample accommodation and facility for the work of the college could be secured—at least, for all that was likely to be demanded for some time to come. Old memories are, to most of us, sacred; and the old memories associated with that which is fast disappearing, will still cling to the new erection, and make us feel that the substitution has been a distinct gain, and that where the good work was commenced by the master-mind of the founder of the institution, it will still be carried on by those who have succeeded him. From small beginings many mighty systems, aye, many mighty nations have been erected, and when we look back into the dim and distant past, and contrast that which was with that which is, we can feel that, though its growth has been slow and sometimes chequered, this institution has risen to an important place in the economy of our country, and that soon it will, so far as bricks and mortar can make it, be a perfected institution. I would not have you imagine from what I have just now said, that I, personally, feel any undue elation of spirit in witnessing the near consummation of my most ardent hopes; on the contrary, I feel that on myself and on

my colleagues has been cast a heavier burden than before, and that, hard as we have worked in the past, we shall be required, if it were possible so to do, to work still harder in the future, if we wish to retain the position we have won; but, more than this, it will be incumbent upon you to put forth your best endeavours, in order to show to the world that the advantages you enjoy over those who have preceded you are not thrown away or misused. To those amongst you who are now entering on your novitiate, I would say: Do not allow one single opportunity to slip from your grasp of obtaining the knowledge you have come here to seek. From the first lecture you may hear within these walls to the last, let not one word, if you can possibly avoid it, be lost; remember that you come here in order to obtain a scientific insight into the details of your profession, and that science, like a coy maiden, must be wooed before she can be won. As this institution, in which you are about to commence your studies, had a small beginning, so must be your beginning, and it is possible that, as with the old buildings so fast disappearing, we may have to root out from your minds old prejudices and old ideas which, if left standing, might act the part of a faulty foundation, and thus lead to the collapse and ruin of any superstructure which might be built thereon. I would have you to realise, too, that it is not alone by the study of those subjects with which you will be most closely concerned, when you have reached that goal which you hope to gain, but by the coincident study of several collateral, and, in the minds of some of you, perhaps, unnecessary subjects, that you can make yourselves masters of the art and science of veterinary medicine and surgery. A spider does not, when it spins its web, rest satisfied when it has made the meshes thereof; it takes care to fix the essential part, the web, by the aid of collateral strands, so firm, that when its victim becomes entangled in its meshes, he cannot, strive as he will, displace his apparently flimsy prison from its moorings. And so it will be in your case; the more you strengthen your veterinary knowledge, by making yourselves acquainted with the collateral subjects you are required to study, the broader will be the basis upon which it will rest, the firmer will it be established in your minds, and the more stable it will become.

Believe me, gentlemen, when I say that the more diligently and the more honestly you work, the greater will be your reward, and the prouder you will feel of your self-won attainments. I do not want you to make a parade of your work or its results. The best work in this world is that which is done quietly and unostentatiously, with, at the same time, a minute attention to details. You cannot see the growth of an animated being, and yet, every atom of such a body has been formed noiselessly and assiduously from a pre-existing cell. The coral reef is the product of tiny creatures, whose work has been carried on without any external show or parade; yet, see how firmly it retains its position in the ocean depths, and what an enduring monument it is to the industry and untiring energies of its insignificant builders.

We scientific workers are sometimes scoffed at by those whose work is of a more practical kind. Let them scoff, say I; all work is good, if it is honest work, whether it be of the hand or the head, and all workers deserve credit for their work, whether it be skilled or unskilled.

> All hail! the honest working-man
> If earnest, sober, true he be;
> The noblest work in Nature's plan
> Is he, is he—if faithful, he.

To some of the older students, I am afraid there will be a sound of mockery in these words. Some there are, I know, who have worked earnestly, faithfully, honestly, and yet have not reached the goal for which they have striven. To these I can offer only the most sincere sympathy. I can only wish them "better luck next time," and direct their thoughts once more to

that little creature to which I have already referred, reminding them that a spider taught Robert the Bruce that perseverance brings its own reward.

But while I utter these words of encouragement, I must at the same time say a few words to those in the senior classes, whose want of success has been due to want of perseverance, or more largely, perhaps, to that greatest of all foes to progress—indifference. It is hard, sometimes, to bring one's mind to dwell upon the contemplation of sober facts; but all the same it is only acknowledging the truth to acknowledge that the want of success in many cases is due to absolute indifference and indolence. It is, however, only doing an act of common justice to say that, in some cases. indifference is begotten of a feeling of injustice; is due to a feeling that, after all the hard work which has been gone through, a better fate was deserved than that which some have met.

In the second and larger part of my address to-day, I wish to touch upon two subjects which are of interest to all who are concerned in the well-being and comfort of the animal creation, and, firstly, I shall deal with the contagious diseases of animals; secondly, with a subject which has of late attracted much attention, and which, so far as its aim is concerned, is the very antipodes of the function of the veterinary surgeon—viz., "the killing of animals."

The important contagious diseases incidental to the domestic animals are:—In Cattle, Pleuro-pneumonia, Foot-and-mouth Disease. Cattle Plague, Anthrax Fever, Tuberculosis, Variola, Actinomycosis; in the horse, Glanders and Farcy, Mange and Influenza; in the sheep, Variola and Foot-and-mouth Disease; in the pig, Swine Plague and Foot-and-mouth Disease; in the dog, Rabies—also inoculable to other animals—and Distemper; in poultry, Tuberculosis.

Of none of these—except, perhaps, Anthrax and Variola Vaccina and Suillus, and Tuberculosis—can it be said that they are indigenous to this country; they are all exotics.

Of the maladies above enumerated, Cattle Plague, Foot-and-mouth Disease, and Sheep-pox have, within my recollection, been exterminated in this country.

Three or four outbreaks of Cattle Plague, numerous outbreaks of Foot-and-mouth Disease, and several outbreaks of Sheep-pox have, within my experience, been suppressed.

In 1861, Professor Simonds, who had just returned from a journey of investigation on the Continent, fully described, in his lectures given at the Royal Veterinary College, London, the characteristics of Cattle Plague, and emphatically declared his conviction that nothing could save this country from a visitation of the disease, unless the authorities realised the probability of such a contingency arising, and adopted vigorous measures to prevent it.

Four years later (1865) the forebodings of Professor Simonds assumed practical shape; the disease did make its appearance, and that, too, from that country from which many of our other troubles seem destined to emanate—Rnssia. Once introduced, the malady spread with lightning-like rapidity, and for a considerable period the responsible authorities seemed paralysed, and the old women and quacks of the country had full play for the employment of their favourite and harmful nostrums. The doctors, too, were very busy, and initiated, as a preventive measure, vaccination. They derided the sounder advice of the members of the veterinary profession, that the disease should be stamped out, and it was not until the homesteads of hundreds of farms had been decimated of their bovine wealth, and many farmers had been hopelessly ruined in pocket, rendered insane in mind, or had put an end to a miserable existence, that the Government stepped in and framed such regulations, as within a very short space of time freed the country of the scourge.

Probably, in the history of no cattle-raising country in the world, was there ever seen such disastrous consequences as those which then resulted from the absolute supineness, lamentable ignorance (for the Government did ignore all sound advice), and reprehensible slackness of a responsible governing body; and the results of this brief period of paralysed effort are felt by many agriculturists to this day.

Warned by this invasion, listening to competent advice, and alive to the disastrous results of a dallying policy, each succeeding visitation of the malady has been promptly grappled with by the Privy Council, and speedily suppressed. Foot-and-mouth Disease had, on and off, a long innings in this country; now raging rampant over the length and breadth of the land, then, apparently from exhaustion, smouldering until the quiescent embers had, from some favouring cause, been fanned into renewed flame, and at other times disappearing altogether, to be re-introduced from some outside centre. It has been the cause of immense loss to the agricultural community, and to the country at large; but at last, by the adoption of vigorous suppressive measures, it has been entirely eradicated, and it is to be hoped that, by no yielding to the *vox populi* of free trade, will the existing restrictions between this and infected countries be removed.

For a century, or thereabouts, prior to 1842, Pleuro-pneumonia existed in this country only in name, and it is now some thirty-three years since, on returning to my home after a prolonged absence, I first became practically acquainted with the malady; one of the first sights which met my gaze being nine valuable cows lying dead or dying in an outbuilding attached to the farm. It was a sight which at the time impressed me very powerfully; it was one I have witnessed, to a greater or less extent, many a time since in the pastures and farm-steadings of Shropshire, Cheshire, and Staffordshire, in the dairies of Lancashire, in the byres of Edinburgh and Leith, and in many other places. I have seen herd after herd, stock after stock, swept away—in some cases, several times over—by this dire and hitherto uncontrolled malady. During the last thirty years fitful efforts have from time to time been made to arrest its course, and at this day we are still witnessing the application of very inadequate measures for its prevention and suppression. How long this is to go on I know not; but of one thing I am convinced, and that is that until the Privy Council of this country determines upon the prosecution of more vigorous measures, and until the voice of the stock-raising community is heard demanding the initiation of such measures, Pleuro-pneumonia will still continue the insidious foe and the decimating scourge of the bovine race in these islands. I have called the disease an insidious one; the term is no libel on its character. It is the most insidious, the most treacherous, and the most intractable of all the zymotic class of maladies.

In my early days, there was neither let nor hindrance to the empirical application of remedies to the sick, or to the indiscriminate disposal of the dead or living members of contaminated herds; consequently, many animals that were wrongfully stated to have recovered from the malady, and thousands of animals bearing the infections in their systems, were scattered broadcast, and acted the part of firebrands throughout the length and breadth of the land,

I have said that so-called recovered cases were frequently the means of disseminating the disease. This fact was not taken into consideration, either by owners or the authorities. I directed attention to the matter about the year 1873, and the opinion then given was subsequently confirmed by Prof. Ferrein, of Berlin, and it has been since universally accepted. At the present day, the dissemination in the manner pointed out above is still going on, only to a less extent. In this city, as in other districts, the disease

has been, over and over again, got rid of, only, however, to be re-introduced after the lapse of weeks, months, or years from without; and the question naturally arises:—Whence comes it? The answer is:—From some centre in this or some other country with which we trade. Were it capable of self-generation, or if it could be hereditarily propagated, there would be no need to ask such a question, but the long-entertained idea—entertained, even now, by some—that exposure, hardship, and bad feeding are capable of generating the disease has been long exploded, and it never had any foundation in fact. The Governmental measures, hitherto put in force for its suppression in this country, have long since been found totally inadequate, and the same may be said of all extra-Governmental efforts in the same direction.

Of the latter, inoculation is of the greatest importance, and is, indeed, the only one of which it may be said that its practice has been attended with any notable degree of success. This prophylactic measure, it has been recently discovered, has been practised by the Moors of Senegambia from time immemorial, but so far as I know, it was not practised in any civilised country until 1852, when Willems, V.S., of Hasselt, Belgium, commenced its practice. Three or four years after, it was introduced into this country, and more than half a century ago, it was practised by Mr. Kettle, of Market Drayton, the late Mr. Moore, of London, Mr. Storrar, of Chester, and other veterinary surgeons in England; while Mr. Menzies, now of St. Austell, practised the operation in Scotland, and, more recently, it has been largely carried out by Mr. Richard Rutherford and others. The greatest of all British inoculators was the late Mr. Priestman, of London, who, during his life, inoculated more cows than have all others put together; but neither by Mr. Priestman or any other inoculator, has the operation been practised on strictly scientific principles, the nearest approach to such being the intra-venous injection of lymph by Dr. Burdon Sanderson and Professor Duguid. In the Netherlands, the operation was, for some years, made a compulsory one and of national application, but the disease was not eradicated from that country by its means; in fact, it signally failed to do this.

In my view, the question of the eradication of pleuro-pneumonia, any more than other disease of the same class, is not a local question at all, nor is it limited to the discussion of any measures of local application. It is—and I have frequently, during the last few years, pointed this out—it is a national question. It is one which not only affects the agricultural community and the veterinary profession, but is of immense importance to the general public and to the state.

If we allow a death-dealing malady like pleuro-pneumonia to linger within our borders, and to stealthily creep among and infect our best herds, what can we expect, but that one of our greatest sources of insular wealth will suffer a ruinous depreciation? It is all very well to boast that we have the best cattle in the world, but of what value will the best be to us when our foreign and colonial customers close their gates against us, and block up the only profitable outlets for our live produce? Can we blame them? Certainly not. The only wonder, to my mind, is that we have escaped for so long.

The opposition to the adoption of vigorous suppressive measures has come mainly from the cattle-interest of the country, and has been based largely on the assumed value of our pedigree-herds, but of what value is pedigree, if the cow or the bull bears in its system the seeds of a malady which is no respecter of pedigrees, of symmetry, or of form?

> What boots it though the rose doth sweetly smell,
> If at its core a canker-worm doth dwell?

The canker-worm in a stock of animals, whether inoculated or uninoculated, which has been exposed to the influence of pleuro-pneumonia, is the frequent

existence in the lungs of one or more of the exposed animals of a patch of damaged lung tissue, which, as I have before stated, may ultimately cause the death of the animal itself, or become a source of infection to those with which it may be associated.

[Professor Walley here intimated to his audience that he had, in an adjoining room, a part of the lung of a bull killed a few days before, in which a patch of pleuro-pneumonia lesion existed, of from four to six months' standing, and, to a moral certainty, this animal had introduced the disease into the byre in which he had been located.]

I am of opinion that this disease will never be got rid of, except by the summary process of slaughtering, coupled with strict regulations, in reference to the movements of animals, and thorough disinfection. The Netherlands Government gave every known method of suppression a trial, and, as we in this country had to do with sheep-pox a quarter of a century ago (after inoculation had failed), and with rinderpest, they had to resort at the finish to the radical method above-mentioned.

Of the other bovine maladies, less notice has been taken. Anthrax has at last been scheduled as a contagious disease, but in the measures which it has been deemed advisable to apply, a curious lack of appreciation of its intensely contagious properties, and of the marvellous vitality of its exciting cause (the Anthrax *bacillus*) is evidenced in the very inadequate regulations laid down for the use of disinfectants in contaminated buildings or sheds, while the disinfection of pastures or water is not even noticed.

Tuberculosis (Consumption), a far more insidious malady, and more destructive, not only to the bovine, but to the human race also, is still to enjoy immunity from any harassing measures for its suppression, and, in the meantime, it is to be allowed to contaminate the flesh which supports the adult and the old, and the milk which forms such a great source of nourishment and refreshment both to young and old, but mainly to those most susceptible to the action of adverse influence—the young; and in the meantime, the inspector of markets must stand idly by while consumptive animals are driven away from before his very eyes to be slaughtered, though he knows full well well that much of the flesh will be utilised in some form or other for human food; and, worse than this, the inspector of dairies is still doomed to see consumptive cows standing in stalls amongst healthy cows, and to see them milked, and the milk mixed with that from the healthy, without being able to apply the slightest measure of prevention to such vile contamination.

It has been shown by my friend, Professor Bang, of Copenhagen, that the milk, even from the unaffected part of the tuberculous udder, is infective, and, what is of more importance, that cream and butter made from it remain infective, even after the former has become sour, and after it has been subjected to the action of a very high temperature.

The Commission lately sitting on this subject in Victoria has recommended the adoption of the very measures of suppression which we have long advocated. Of the measures in force for dealing with Glanders and Farcy, I have nothing here to say. We have demonstrated repeatedly that they are sufficient for the purpose they are intended to subserve—if they are properly applied.

Of Influenzas, it may be said that we do not as yet possess sufficient knowledge of their determining cause to enable us to frame any satisfactory laws for their suppression.

Swine-fever has, for some time past, made its presence felt amongst us in a most unmistakable manner, and it has claimed a holocaust of victims, but, like the other maladies with which I have dealt, it ought to have become a thing of the past, and I must confess that it is a little puzzling to sanitarians

to see orders issued one day and withdrawn the next. The only objection, at all, of a valid nature, in my view, against compulsory slaughter of contaminated swine, is the destruction of breeding animals, for, in my experience, I have found that the disease is most severe in the young, and that, if these are removed, a very large percentage, and, in many cases, the whole of the breeding animals will escape. There exists, however, one source of danger, even with these, and that is, that, as with Pleuro-pneumonia in cattle, there is a probability of one or more having the disease in a modified form, and recovering therefrom, and subsequently becoming an unsuspected centre of infection, owing to the existence of intestinal or lung lesions.

In dealing with this disease, there are two facts, the importance of which does not, to my mind, seem sufficiently appreciated, viz., the part played by rats in its dissemination and the vitality of its virus. Rats should be ruthlessly exterminated in all places in which the disease makes its appearance, and I think their destruction ought to be included in the Privy Council Regulations. In reference to the vitality of the virus, two instances have come under my notice within the past few months, in which the disease reappeared after the lapse of nearly twelve months after its apparent suppression.

Of all the contagious maladies affecting our domestic animals.Rabies is of the most importance, insomuch as it is so readily propagated to all animals. It has existed in this country for a considerable period, but it was not until 1871 that it came, to any extent, under my personal observation. In that year, and in many previous years, it raged to an alarming extent in some parts of Lancashire, Yorkshire, and Derbyshire, but it was not until 1881 that it assumed sufficient proportion to attract attention in Scotland. During 1881, large numbers of dogs, and a few horses, were attacked by the malady in Edinburgh and the neighbourhood, and, unfortunately, it claimed at least two human victims, before attempts were made to arrest its progress. After a time, however, the magistrates, acting on professional advice, put in force such measures as were found sufficient to exterminate the disease in the course of a very short time, and I fail to see why similar measures have not been carried out by every body of magistrates in the kingdom when circumstances demanded their adoption.

It is gratifying to observe that the Privy Council authorities have at last realised the gravity of the position, and have taken legislative cognisance of the disease. In circumstances such as the present, it will, perhaps, be expected that I should say one or two words in reference to the Pasteurian method of prevention of this malady, and also as to the raid recently carried out against stray dogs in this city. Acknowledging, as I do, the scientific value of Pasteur's work, and recognising its importance in a prophylactic sense, I must, nevertheless, confess that I am even now, as I was at the very outset, somewhat sceptical as to the actual power of inoculation to prevent the development of Hydrophobia in persons bitten by rabid dogs.

My own impression was, and is now, that the surroundings and adjuncts of the process of inoculation had as much to do with the effecting of any real good as had the operation itself, and it is a matter of common knowledge that many people, of whom it is said that they have been bitten by a mad dog, have never been bitten by a mad dog at all, and it is equally well known that the percentage of persons bitten by unmistakably rabid animals, who become hydrophobic, is very small indeed. It is a curious commentary upon the recent attempts, which have been made to prevent the development of Hydrophobia by the neutralisation of its virus, that in 1790—nearly a century ago—a Tuscan physician, Dr. Eusebio Valli, conceived the idea of correcting the saliva of rabid animals by means of the gastric juice of the frog. This physician not only conceived the idea, but carried it out—at least to his personal satisfaction—successfully.

During my residence in this city—as previously in other towns—it has fallen to my lot, on various occasions, to have had to make *post-mortem* examinations on the carcases of dogs supposed to have been the subjects, during life, of Rabies, but in whose organs I could not trace a single sign of the existence of the disease.

The fits of Distemper and other convulsive fits are frequently mistaken for Rabies; and, in not a few instances, in such cases, temporary and sudden frenzy is actually produced by the officious persecution of temporarily insane bystanders. In reference to the step recently taken by the magistrates of this city, in connection with stray dogs, I may at once say that they have only done that which, as guardians of the public safety they were bound to do, and that which, in my official capacity, I advised them to do. The only thing to which I could offer any objection was the muzzling of dogs under proper control, but it appears that the magistrates had no option in this respect.

Muzzling does not, if the muzzle is properly made, inflict that amount of suffering in dogs that some people seem to think, and if it distresses them at the outset, they quickly become accustomed to it. In two respects, muzzling is advantageous: first, in the prevention of fighting, and, secondly, in preventing dogs from eating the rubbish they frequently do eat from ash-buckets and similar receptacles.

No reasonable person could object to the seizure and destruction of the vast army of vagabond dogs, which infest the streets of our large towns, and which become, in time, an intolerable nuisance, and an undoubted source of danger. Moreover, the carrying out of such measures puts an end to many a poor waif, whose life has been rendered miserable by incurable, loathsome and neglected disease. Had I my own way in these matters, I would institute a periodical raid on the canine vagabonds of our streets, and I have no hesitation in saying, that if such was universally practised, there would soon be no necessity for instituting, in civilised countries at least, experiments for the purpose of discovering an antidote to the virus of Rabies. Pasteur's occupation would be gone, and the agonies of Hydrophobia would cease to be one of the evils of human life.

Veterinary surgeons resident in India have shown that when all pariahs have been ruthlessly and promptly despatched, Rabies have become, in districts where it had raged for years, a thing of the past.

In concluding this part of my address, I would ask to be allowed to say that, in my opinion, the regulations for dealing with contagious diseases in this country are very deficient in several respects. Firstly, in not being carried out by one central body; secondly, in the matter of prosecutions. Certain penalties attach to the breaking of the law. but an offender has only to plead ignorance, and to back up his plea by the corroborative evidence of his own hirelings or by that of his friends, to escape the punishment he deserves. In many instances, the plea of ignorance is undoubtedly a just one, especially in the case of Pleuro-pneumonia; and I think, in order to ensure that punishment shall be meted to those who deserve it, the Privy Council should establish a universal system of licensing or registering the owners of animals, and should direct local authorities to supply all licensed persons with a brief and plain printed description of the symptoms of the contagious diseases peculiar to the animals so licensed.

If this were done, there could be no plea of ignorance put in as a justification of neglecting to report the existence of contagious disease. Thirdly, I am of opinion that full power should be given to veterinary inspectors to slaughter suspected animals, for the purpose of gaining satisfactory evidence as to the nature of any malady of a doubtful character under which they may be suffering. Fourthly, I regret to see that in the last Animals Order (1886) issued, the old mistake of sparing animals which have been exposed in fair

or market with diseased animals is perpetuated. Such a regulation, especially in connection with Foot-and-mouth Disease and Swine-fever, is, in my view, a grave error. Fifthly, the permissive nature of many regulations renders them practically abortive. Thus, by the Animals Order of 1886, local authorities have the power given to them of prohibiting the introduction into their districts of animals from places wherein Pleuro-pneumonia exists, and, in like manner, they may prolong the statutory period of quarantine (56 days) in dealing with the same disease. Experience has shown that such permissive legislation is, for all practical purposes, useless; as local authorities, like other authorities, will interpret the word "may" in their own fashion, and very often, I am afraid, according to the manner in which it affects their personal interests.

*The Despatching of Animals*, it may be thought by some, is not a subject for the consideration of those who are supposed to be engaged, rather in the preservation of life, than in its destruction. The penalty of life, is death, but it is, surely, within the scope of the veterinary surgeon's art to do all he can in the way of seeing that the paying of this penalty is not associated with unnecessary pain or suffering, and, certainly, there are few men who, from their knowledge of the anatomy and physiology of animals, are more fitted scientifically to act as guides in such a matter than are veterinary surgeons.

Our every effort should be, and I believe, without exception, is, to conserve life, but there are times when the veterinary practitioner would fain lay aside his healing function and act the part of a slayer; as, for example, when, in his inmost soul, he feels that he can do nothing to alleviate the sufferings of his patient, or to bring about a permanent or successful cure. Many a time and oft, have I desired to put an end to agonies which I have been powerless to alleviate, and not infrequently have I been allowed to do so, but, sometimes, either from self-interest, timidity, or cupidity, I have been prevented from so doing; occasionally, too, red-tapeism steps in and arrests the infliction of a merciful death-blow. I have been led to consider this subject in this place, by the recent discussion in the public press in reference to the despatching of dogs seized by the police under the orders of the magistrates, and I propose (1) to consider the reasons which influence us in the destruction of animals; (2) the methods by which such destruction is carried out. Animals are destroyed for domestic purposes, most largely, in order to satisfy human hunger—to appease, in other words, that craving for animal flesh which seems an inherent part of our common nature; but, in addition to this, destruction is carried on for these beneficent purposes to which I have already alluded—viz., to the taking away of a life which has become, by virtue of the existence of an incurable disease, or by the processes of decay attendant upon senility and, ofttimes, overwork, a burden to its owner; and, worst of all, it is too often practised, in order that malice against the person may be appeased. This, I need scarcely say, is the meanest and most reprehensible of all the motives that actuate man in performing a function with which he, as the lord of creation, is especially endowed.

The ordinary methods by which destruction of life is brought about are numerous, but in every instance, their action is exerted on one or other, or on several, of the great central organs of life—the brain, the spinal cord, the heart, or the lungs. It is seldom that the simultaneous and instantaneous annihilation of all the vital functions is accomplished by means of a shock, such as is induced, for example, by the throwing down of an animal either from a great height or with great force, or by the application of electricity. Many people are greatly horrified when they see an animal dashed to the earth with great violence for the purpose of depriving it of life, but there are few methods of destruction more effectual or more merciful than this. As a

boy, I have frequently joined in the pastime of "hoisting" frogs, and that, too, not from any actual motive of cruelty, but rather that I might gratify that instinct which seems inherent in boy nature—the instinct of destruction, and while, by the light of the knowledge which in maturer years I have gained, I acknowledge that the practice was a reprehensible one, inasmuch as it fostered and nourished the destructive instinct, I nevertheless feel that my more matured knowledge enables me to quieten any qualms of conscience I at one time felt in connection with this subject, by the reflection that, though the motive which influenced me in thus depriving the frog of life was, to some extent, a criminal one, the actual method of destruction was, on the whole, as merciful a one as could have been devised. And so with electricity. The idea of an animal being suddenly deprived of all vital function by a stroke of lightning is a shock to the finer instincts of man's nature; nevertheless, there is no more merciful way of ending the existence of an animal than this. But there is a reasonable objection (though by some it may seem, to some extent, a theoretical one) to the adoption, ordinarily, of such a method for the attainment of such a purpose, and that is, that a material and deleterious influence is exerted on the flesh by electricity. Such a delerious influence might be counteracted if the immediate withdrawal of blood—as is practical in the ordinary methods of destruction—from the electrified carcase could be carried out; unfortunately, however, we are taught by practice that this cannot be done, at least, to the necessary extent.

That the two modes of deprivation of life above noticed are painless, I think there can be little doubt. Personally, I have not experienced the effects of a violent shock of electricity, but, when a boy, wishing to satisfy a desire for more of the good things of this life than I was entitled to, I did experience the sensation of shock by concussion when I fell from the uppermost branch of a plum tree, with my pockets stuffed with plums.

I am ashamed to confess that, rude as was the shock inflicted by the violent contact of my body with mother earth, I was, after I recovered consciousness, more concerned in disposing of all traces of my misdeeds, than I was with the present or ulterior results of bruised muscle and bone, or the contemplation of the probability that, if I had fallen a little farther, I should never have known the pleasure of possessing the prize, for the possession of which I had dared so much.

The ordinary methods of destruction employed are as follows:—

(1) *The Brain—(a) Direct penetration and more or less laceration* by the pole-axe, by the bolt, or by gunshot or rifle bullet; *(b) concussion* by blunt axe or hammer, and, in the case of the pig, the bludgeon; in smaller animals, by dashing the head violently against a fixed object.

(2) *The Spinal Cord—(a)* direct severance with the knife, "pithing;" *(b)* by dislocation or fracture of the neck; *(c)* by laceration after penetration of the skull with the pole-axe.

(3) *The Heart—(a)* by puncture with a sharp instrument; *(b)* by laceration and penetration with gunshot or rifle bullet; *(c)* by inflature with air.

(4) *The Lungs—(a)* by deprivation of oxygen (air) mechanically, by compression of the windpipe as in strangulation (hanging); *(b)* by oxygen starvation, *i.e.*, by exhausting the air of oxygen by the aid of an air-pump, or substituting another gas, as nitrogen, carbonic acid, or carbonic oxide; *(c)* by paralysing respiration with poisons, such as prussic acid, morphia, chloroform, or carbon disulphide, or an admixture of the two last.

(5) Death is sometimes produced by depletion of blood, and in all cases where the flesh of an animal is destined for use as human food, the abstraction of blood is the last and necessary act in the tragedy.

Direct penetration of the brain is accomplished usually by a blow from a

pole-axe, the best pattern of which is undoubtedly that designed by Mr. Sargent, of Stoke-upon-Trent, and known as the "Excelsior." Like all other pole-axes, its use is most satisfactory when followed up by laceration of the spinal cord by the aid of a cane; or penetration can be certainly insured by the use of the Bruneau mask and bolt. The mask in question was invented by M. Bruneau, of Paris. It is, in effect, a pole-axe, but it possesses this advantage over that instrument, that the operator cannot, by any possible means, inflict unnecessary agony by missing his aim, as so often occurs with unskilful or unsteady hands, when delivering the blow with an axe. By its use, such a harrowing spectacle as that which I once witnessed in London—when a skilled pole-axer struck a blow at the skull of a horse, but, striking too low, the axe penetrated the frontal bone below the seat of the brain, and the horse backed round and round the yard with the operator clinging to his axe and using his best endeavours to dislodge it—can never arise. In the Bruneau method, the mask is adjusted, the bolt is placed in the receptacle prepared for it, and driven home by a smart blow from a heavy mallet.

The animal, being blindfolded, is utterly unconscious of the coming blow, and consequently does not swerve when the mallet descends. The pole-axe is used most largely in England. In Edinburgh, its use is largely substituted by that of the blunt axe. Some years ago an endeavour was made to introduce the Bruneau method by the Messrs. Brechin, of this city, and myself; but the attempt met with so much opposition as to lead us to desist in despair. In like manner, I, at one time, endeavoured to substitute the Excelsior axe for the blunt axe, but the endeavour failed. I am happy, however, to be able to state that the pole-axe is now used by some of the slaughtermen at the Edinburgh Abattoir, and others are making inquiries in reference to it.

Penetration of the brain, and annihilation of its function by gunshot or rifle bullet, is practised regularly in some districts. In the neighbourhood of Edinburgh, however, I am only acquainted with one butcher, Mr. Watson, of Dalkeith, who has followed out the practice in the killing of cattle. In the destruction of horses, it was regularly practised, some years ago, by Mr. Dickson, at the Bonnington Tannery. Of all deaths, that by gunshot, rifle, or revolver-bullet is the most certain and the most merciful, and were I given the choice as to the method by which I should wish to die—assuming I had to die by violence—I should most certainly choose this. As to whether penetration should be effected through the frontal bone or through the base of the skull, under the ear, it is a matter of opinion; personally, I prefer the latter, as the continuation of the brain with the spinal cord is lacerated at the same time, and death is absolutely instantaneous.

The objection of danger to individuals may be urged against the use of fire-arms; this could be reduced to a minimum by appointing one person in every licensed abattoir, and there should be none unlicensed, to carry out the duty.

Annihilation of brain function by concussion is practised mainly in Scotland. If the blow is delivered in a proper manner, and with sufficient force, it is undoubtedly effectual in producing absolute and instantaneous unconsciousness, but unfortunately it sometimes, I may say, frequently happens, from various causes, that the blow is not effectual, and requires to be repeated, not once or twice, but several times before unconsciousness ensues, and I have seen a bullock break loose from the rope by which he was supposed to have been secured, and rush wildly about the yard at the abattoir, with one horn knocked off, and the blood streaming down his head. So much have I been impressed with the unpleasant results produced by the blunt axe, that I have endeavoured to embody my impressions in the following verse:—

A rope around my neck they placed,
And hauled my head to ring
Fixed firmly in the wall, and struck
Great blow with mighty swing.

The axe upon my skull did fall
With stunning blow, and keen,
But, as 'twas blunt, it only dimmed
My senses and my e'en.

Oh! had they, with revolver bright,
A bullet put into my spine and brain,
Inhuman battering I should spared have been,
As well as all this misery and pain.

And now, with quivering limbs outstretched,
I wait for rest and ease,
And plead that he who holds the steel
Will give the *coup de grace*.

(*To be continued.*)

## GLASGOW VETERINARY COLLEGE.

THE winter session of this college commenced on October 27th, when a large attendance of members of the profession, students, and visitors were present. The introductory address was delivered by Professor Limont, as follows:—

GENTLEMEN STUDENTS,—My first duty is to give a hearty welcome to those of you who sit upon these benches for the first time. Let me ask you all to remember that in this college we do not look upon our students as mere class-units. We like to get to closer and kinder relations. My second duty is to welcome old faces to a new world. During the long vacation, much of the old familiar place has undergone a transformation. We have now college rooms that some medical schools of renown might envy. The ingenuity of Principal McCall has given us an admirable dissecting room, a new museum, a large biological laboratory, and an improved lecture theatre. These are all upon the same level, and open into each other by private doors. Each has its students' entrance, and many arrangements for your comfort. For Principal McCall, I have to ask you to make good use of them. For myself, I ask you to do your very best in one of them—in the capital dissecting room of my colleague, Professor McQueen. Certainly, you may neglect this, and yet pass your examination. But I speak of what I know, and tell you that in the long run you will be sorry for it. Take my advice, and make the most of your time there. Your laboratory work with me is not quite of the same importance. The practical physiology of greatest use to you in future days will be a knowledge of fact and theories—something in the mind, not in the fingers. A certain amount of laboratory work is useful in helping you to this knowledge, and in training you for clinical work. But I shall not allow you to imitate many girls and some students; I shall not allow you to waste time at useless fancy work, no matter how gaudy the colouring may be. We have no time in our curriculum for elaborate idling. But I hope to make skilled workers of some of you.

Gentlemen, I ask you to consider with me the bearings of recent advances in pathology upon two arts. One of these is the Art of Dressing a Wound.

The other is the Art of Human Preventive Medicine. The latter, unless I am mistaken, is about to come within your range.

### *Rôle of Leucocytes in Health.*

We understand pretty well that in health the leucocytes are the jackals of the body. They patrol the highways and byeways of the blood-stream, and wander out into the tissues to devour the bodies of the tissue-cells that die in ordinary course. This ghoulish feast goes on merrily enough in the tadpole's tail when it is about to be dropped.

### *Rôle of Bacteria in Disease.*

The millions of leucocytes and tissue-cells that make up an animal, like fish, live in a liquid. This liquid is, of course, the blood and lymph. And into this liquid, bacteria, and other low plants, are apt to get. Sometimes they multiply in it. In this case, besides robbing the cells of their food, they may poison them with excretions they pour out.

### *Rôle of Leucocytes in Bacterial Disease.*

Sir Joseph Lister used to insist long ago upon what he called the antiseptic power of healthy living tissue. And years ago, at Dublin, he remarked that leucocytes seemed to have this power. We are now beginning to understand the full significance of this power. For the leucocytes and tissue-cells do not submit to the bacterial invasion without a fight. In fact, the leucocytes leave the blood to go to the help of their weaker neighbours in the lymph—go to the help of the tissue-cells. So that instead of comparing them to jackals, we may compare them to military police. Their duty is to defend themselves, and to go to the defence of the tissue-cells. When a water-flea is kept in a tank, spores get into it and grow. But the leucocytes are seen to fall upon the intruders, and numberless fights come off. If the leucocytes win and kill the invaders, all is well. If the leucocytes lose, the flea is doomed.

How is the fighting done? It is sometimes at very close quarters, for a living, wriggling bacterian may be seen in the interior of a living moving leucocyte. After a time, one of the combatants becomes still in death, and disappears. We know that leucocytes can digest dead material, such as the bodies of bacteria. We may suppose that their digestive juices kill, and then digest the bacteria. They may behave to bacteria as we do to oysters. And we know that bacteria can excrete poisons fatal to protoplasm. For one of these *(sepsin)* has been separated and proved to be deadly. We may suppose then, that the bacteria, in the liquid and in the interior of the leucocytes, kill the cells by poison. After this, they may eat them, or, as we say, break them up. Sometimes the poisoners poison themselves. For when the excretions of bacteria accumulate to a certain extent, they poison the bacteria themselves. Like the inhabitants of a crowded city, they die in their own filth. The bacteria may die out from other causes. The available food in the liquid may become exhausted, or the liquid may become too concentrated for them. The latter condition may exist in the liquid of a wound; and accordingly a thick discharge is, as a rule, sweeter than a thin discharge. This dying out happens in most acute abscesses. Let the contents of an acute abscess be aseptically tapped as it runs its course. At first you get a vast number of living micrococci (bacteria) and a few leucocytes; later, a few dead micrococci, and a vast number of leucocytes in the shape of pus-cells. Before the abscess bursts, the micrococci have died out. This explains, perhaps, why (except in Aseptic Surgery), we don't open an abscess until it is ripe. If we opened it sooner, the leucocytes would have to deal with two sets of bacteria

—the original micrococci, and the putrefactive bacteria from the outside world.

*Rôle of Leucocytes in Wounds.*

Let me liken a wound, say a gunshot wound, to the sudden swoop of an enemy, upon a peaceful country inhabited by tissue-cells. The enemy is off and away, leaving behind him the dead bodies of tissue-cells, munitions of war in the shape of shot-pellets, and, perhaps, camp-followers in the shape of bacteria. Then, after the rush is over, police, in the shape of leucocytes, swarm out of the blood-vessels. And perhaps the surviving tissue-cells, by division, furnish special constables. The duty of the police is to clear away the bodies of the slaughtered tissue-cells, to try what they can do with the shot-pellets, and to extirpate the bacteria. There is generally no difficulty with the dead tissue-cells, for we know how easily a bit of dead tissue disappears if no bacteria have reached it from without. Nor with the shot-pellets under the same condition, for we know how they become encapsuled—the leucocytes cannot clear them away, but they settle down round them as a capsule of cicatricial tissue, and hem them in. But to tackle the bacteria is another affair. Sometimes, no doubt, the leucocytes "eat them up" quite in Zulu fashion. If you cut your chin in the morning, you expect this to happen. But often there is a long and disastrous struggle. Thousands of leucocytes are hurled upon the bacteria—only to perish, and cumber the field in the form of pus-cells. And worse. The unvanquished bacteria may so flourish and multiply, by reason of shelter, warmth, and plenty, that they begin to attack the tissue-cells which escaped the original enemy—the wound spreads. And worse. Hordes of bacteria may make off by the vessels, and make mischief in distant places—pyæmia sets in. Or even worse. Their poisonous excretions get into the vessels in large amounts—septic intoxication suddenly supervenes. Of course, if the leucocytes are getting the worst of it, they cannot clear away dead tissue or form capsules round shot-pellets. In truth, the pus-cells are nearly all quite dead. Although it is generally over bacteria that leucocytes come to grief, sometimes dead tissue-cells, and shot-pellets, etc., are too much for them. Even a simple bruise may suppurate.

*Rôle of Liquid Exudate in Wounds.*

The cells of a wound, like other cells, can only exist in the liquid lymph that exudes from the blood-vessels. This may be in excess from the beginning, owing to the addition of serum from extravasated blood, or to excessive exudation—as in the case of an abscess cavity rapidly emptied of pus. If the excess does not leave by the veins and lymphatics, or drain away from the orifice of the wound, it gathers and causes "tension." It is a new enemy, and provokes a useless pouring out of leucocytes, that is to say, suppuration. And it forms a splendid breeding pond for bacteria.

*The Double Supply of Wounds.*

There are then, two supplies to a wound, (1) a supply of leucocytes to do certain work; (2) a supply of liquid for the leucocytes. When the leucocytes have done their work, they develop into cicatricial tissue. And this view of the process of healing gives us a sharp insight into the three wants of a wound. They are, (1) protection of leucocytes and tissue cells from bacteria —if need be; (2) drainage of liquid—if need be; (3) nothing else.

*Aseptic Surgery.*

If you meet the first want completely, you achieve Aseptic Surgery. And if you meet the first and second completely, and the third almost completely —why, you can do anything. Certain surgeons, headed by Sir Joseph

Lister, can count upon this in most operations. To them the opening of a joint is hardly so serious as the treatment of a common whitlow.

### *Antiseptic Surgery.*

If you meet the first want in part, you practice Antiseptic Surgery. And at present, veterinary surgeons must, as a rule, be contented with this. Let me tell you that this art is harder to learn than the more brilliant one of Aseptic Surgery. The root of most evil is this, that meeting the first want only in part, you are face to face with enormous difficulties in trying to meet the second and third. If bacteria get into a wound, the wound is apt to become a pus-bag. Extra drains have to be put in. The drains lead in more bacteria to the pus—already containing too many. And again, the filthy drains act as foreign bodies or irritants. There is a kind of vicious inter-action, which you may easily make worse by bungling surgery.

### *The Secret of Aseptic Surgery.*

The secret of Aseptic Surgery is threefold (1) protection from bacteria is perfect, and does not interfere with drainage; (2) drainage is perfect, and does not interfere with protection; (3) the means of protection and drainage practically do nothing else to the wound. Sir Joseph Lister was the first man to succeed in putting up most wounds free of bacteria, and in keeping them free. An antiseptic was used during the operation and the subsequent (rare) dressings. But during the intervals it was kept off the actual surface of the wound. It therefore had a very slight irritant action upon the cells. The drains met all the need of drainage. Like the ligatures and stitched they were smooth and nearly non-irritant. In time, drains of decalcifies bone, and ligatures of prepared catgut came into use. They are eaten up by the leucocytes as the need for them ceases. The discharge of the drains was into dressing material impregnated with an antiseptic. Thus the drains did not lead bacteria into the wound.

### *The Secret of Antiseptic Surgery.*

The secret of Antiseptic Surgery is to meet the total want of the wound as well as this can be done. When you try it, never forget that, in meeting one or two wants you may so aggravate the remaining wants, that you do more harm than good. Never put bacteria into a wound when you try to fend off bacteria, take care that you don't keep in the discharge, and thus provide a capital breeding-pond for the bacteria there already. When you try to kill bacteria in a wound, take care that you don't kill more cells than bacteria. When Ambrose Paré made that great reform at Paris, the surgeons were trying, with complicated dressings, to keep off what we now know as bacteria. They failed, but they succeeded in making drainage impossible. Many men, nowadays, continually flood wounds with carbolic acid. This is like firing upon friends and foes, and doing most execution upon your friends. Carbolic acid, though put to admirable use in Lister's Method of Aseptic Surgery, is rather a dangerous general antiseptic. Don't use an antiseptic when it is not needed. If you cut out a V-shaped bit of the lip with clean instruments and fingers, and if you stitch up the wound handsomely, no antiseptic is wanted. The leucocytes from the rich capillary network of the face will make short work of any bacteria. When you provide drainage, let it be enough; but not too much. A needless drain is a wanton foreign body, and along it bacteria creep into the wound. Such a wound of the lip as I have spoken of needs no drain—the natural drainage into the mouth is enough. And this holds good sometimes for greater wounds, even for incisions through the peritoneum. Remember the advantages that an

artificial drain gives. You need only make an opening into an abscess big enough to receive the tube. You can stitch up a wound as close as you like. Remember your choice of methods. After emptying an abscess, you may press its walls together with elastic pads and bandage. According to ordinary physical laws, this prevents excessive exudation from the vessels in its walls. You may drain with a tube, or with a strip of lint. You may use a dressing material that sucks out the discharge. The controversy of Wet *v.* Dry Dressings, turns nowadays (when such dressings are always impregnated with antiseptics) rather about their draining powers than about any question concerned with bacteria. All dressings must be wet next the wound—otherwise the cells would die. If dry above this, they have greater draining power, and allow greater concentration of the discharge. But the discharge is apt to cake into a scab. A scab is a capital dressing if the leucocytes are able to extirpate any bacteria below it, and if no drainage is necessary. But it will not do if there must be drainage. Do nothing else—as far as in you lies. You look to this when you are attending to protection and drainage. But you must keep it in mind until the wound is soundly healed. Rest—that is, the absence of irritants, of new enemies—must be provided for. It is not broken bones alone that require the use of a splint.

### *Contagious Diseases (Animals) Act.*

Before I pass to the wider subject of the general Public Health, let me have a word upon this Act. Take such a set of Orders as those prohibiting cattle imports from a certain port. It is not enough to show that this action lessens, or prevents cattle disease in this country. Sooner or later your countrymen put the blunt question—Does this, upon the whole, lower the price of meat, or is it only a bit of protection for home stock-raisers? The answer requires a double knowledge—a knowledge of disease, and a knowledge of trade. The moral is that you should master pathology, and always keep your eyes and ears open.

### *Public Health.*

In these times we live under the protection of a set of Public Health Acts that strongly resemble flying machines. Somehow they won't work. The Boards appointed to carry them out are far too sapient to do anything of the kind. Their money is frittered away in small sums upon an army of nominal officers. Like other armies, it exists largely on paper. Most of these officers know little about their duties, and are not likely to try to fulfil them. But reform will come—I think with the reform of Local Government. In spite of the medical M.P.'s, including I suppose, Dr. Tanner, it may be far off. But it will come. And when it does, veterinary science ought to claim a share in the making and administration of the law. For every Medical Officer of Health, I would have a corresponding Veterinary Officer of Health, working under the same authority. They should have work and pay enough to make them independent of undue influence. I would arm the veterinary officer with power to protect men from animals, and animals from animals. At present medical officers seldom know anything about Comparative medicine. They condemn meat—or they don't. And what does this mean? Meat may contain dangerous parasites other than bacteria, and yet these men don't know what to look for. Again, meat may contain specific bacteria, and be dangerous even to handle; or it may contain other specific bacteria, and be quite (or nearly quite) safe and wholesome. How many tons of meat are wasted every year because somebody says it is "diseased," or because an ex-butcher says it is "not good"—that is, not fit for sale at ordinary market-prices. It is a shame to pass bad meat, but I hold it almost a sin to condemn poor meat, and so put flesh out of the reach of the poor, who need it most. The deci-

sions ought to be based upon the experience of veterinary surgeons, shepherds, and others, for this experience is really a long series of rough but fairly good experiments, upon exact experiment, and upon pathological theory. Before meat is thrown away, an expert ought to consider whether the damage likely to be done by it, if passed, will not come to less than the damage done by its destruction. To take another case, we know that the carcases of animals dead of certain diseases rot so quickly that it does not do to pass them. The elimination of these is a task for the pathologist. In cities, at any rate, such a man ought to look after the meat-supply. It is hardly necessary to remark that dairies, rather more than slaughter-houses, require skilled supervision. The milk-supply is a stream that may be contaminated by cows, dairy-folk, and water. Sometimes the milk may be unjustly blamed, but often it is the carrier and fosterer of deadly disease.

You all know how a disease sometimes passes over individual men or animals. What holds good for individuals holds good for kinds. Thus Anthrax strikes down men and oxen, passes over dogs, and strikes down mice. Every kind seems to have its own assortment of diseases taken from a common stock. And we have studied so few of these assortments, that we have really no right to speak of a disease as peculiar to any one kind. But a disease, instead of passing over an individual or a kind, may pass through in a mild form, and often unnoticed. Perhaps it finds a poor soil, or, to put the same thing in another way, perhaps it meets an antidote in the animal. When the disease comes to the next individual or kind, it may strike with the old vigour, or even with greater vigour. But, on the other hand, in certain cases it passes through in a mild form. Plenty of laboratory instances of these variations are known, and recently a very startling first-case has been stated against Scarlet Fever. It is said that Scarlet Fever passes through the cow in a form hitherto unnoticed, and thence passes to man in the milk. I shall not discuss the evidence to-day, for such cases ought to be very strong before they are allowed to "come out" and grow fashionable. But the mere possibility of such a thing ought to make a romance of your studies in pathology. Some of you will yet become guardians of the health of your fellow-men. At least you will deserve this, if comparative pathology advances much further in this direction, and if you advance with it.

Gentlemen, I suppose I ought to give you some good advice. I do not think much of most advice. The giver is apt to illustrate the glib and gratuitous application of a doubtful general rule to an unknown particular case. The taker is apt to suffer the fate of the old man in the fable. But it has its place. I am not going to speak to you as "young men." I don't know that young men are, upon the whole, any worse than old men. I don't see that they specially need the administration of doses of moral spring and autumn medicine, or of much wrapping-up in cotton-wool. I shall speak to you simply as an old student, who has been through it all. To work, you must be fit for work. Eat plenty of good food, and take care that you thrive upon it. If you cannot get a pleasant meal in your rooms, dine at some cheerful restaurant—there are plenty in Glasgow. A student cannot afford to have Dyspepsia. Learn to sleep with your bedroom window open, and so begin the day with unpoisoned ganglion-cells. It makes a difference of fifty to a hundred per cent. in the forenoon brain-work. Take a walk every day after the classes are over. On Saturday go for a long tramp in the country. When you have got back, and have changed your clothes, you will find that, as Kingsley says in "Westward Ho!" "Up comes duty like a jolly breeze." On Sunday rest from your ordinary labours.

"Iron sharpeneth iron; so a man sharpeneth the countenance of his friend." Be at the weekly meeting of the College Society. One thing that ought to be learnt there by students is "the curt knowledge whether or not they are

speaking of what they know." I am afraid, though, it is not always learnt at societies.

Make the after part of the Society-night, or some other night, your private holiday. On that night read the books that every gentleman ought to read, cultivate some of the better forms of art, or call upon your friends. In the long run each of you will be taken, as I have heard it said, not for "what you are, but what you are yourself." And professions rise and fall with the men that compose them. Make good use of this weekly holiday, for a good deal depends upon it. Keep to study on other evenings. A man of fair intelligence, who attends to his work here, and reads hard for a few hours four or five nights a week, is pretty sure to pass his examination in spring. Then he may say *in memoriam*—

"Can trouble live with April days,
Or sadness in the summer moons?"

"Who hath sorrow? who hath contentions? who hath babbling? who hath wounds without cause? who hath redness of eyes? They that tarry *long* at the wine." As to another matter, read the seventh chapter of the Proverbs of Solomon. But I ask you to be a little less selfish than this keenest of Hebrews. Look beyond yourself, and think of the pity of it.

Gentlemen, "some are born great, some achieve greatness, and some have greatness thrown upon them." These are the words of Shakespeare. Let me add that men are most fortunate when they have to achieve it. There is greatness, and greatness. But there is one greatness that you can at least reach towards. You may strive to do your duty to God and man with all your might. I know no greater greatness.

## ROYAL AGRICULTURAL SOCIETY.

At the monthly Council meeting, held on November 3rd, Sir John Thorold (chairman) presented the recommendations of the Committee as to the appointment of Mr. J. B. Polding, of Red Lion Street, Burnley, as Provincial Veterinary Surgeon of the Society for the county of Lancashire, in the place of Mr. Bromley, deceased. A letter had been read from Professor Robertson in reference to protective vaccines, which the Committee recommended should be published in the proceedings of the Council.

"Dear Mr. Jenkins,—In reference to the experiments connected with the preparation of protective vaccines for certain contagious diseases affecting animals of the farm, agreed upon to be conducted for the Society, I have at present to state:—

"1. That, after considerable delay, I have obtained the sanction of the Home Office for the registration of certain portions of the buildings of the Royal Veterinary College as a place in which these experiments may be conducted, and have purchased certain animals and instruments needful for this purpose.

"2. That we are now ready to carry out protective inoculation for quarter-ill in cattle or sheep upon a limited number of animals within a reasonable distance of London, by use, at the present time, of the French prepared virus. This, in the meantime, it must be remembered, is with us merely experimental, and will continue to be so until the opportunity of testing its efficiency is afforded.

"3. I am desirous of receiving information of the existence of quarter-ill with the view of securing the material of the natural disease from which to start the preparation of the protective vaccine. The animals affected will require to be obtained by us previous to putrefactive changes having set in.

I may state that with this object in view advertisements have been inserted in the VETERINARY JOURNAL, and I would further desire to draw the attention of the members of the Royal Agricultural Society to the same subject.

"Having already spent £40 in the purchase of animals, instruments, &c., I would now desire that £50 of the grant agreed to be now paid to me.

"*October 28th.*" "W. ROBERTSON.

The Committee recommended that £50 be paid to Professor Robertson.

Mr. LEWIS, of Monmouth, Provincial Veterinary Surgeon for the county, had forwarded the following reports on the injurious effects upon cows from drinking impure water, and on some cases of rabies:—

*The Injurious Effects upon Cows from Drinking Impure Water.*

In August of this year a farmer residing ten miles distant came to consult me concerning two cows which he said were unwell, one of which had been observed to breathe quicker than natural for two days previously, and was now worse; and as another had failed, he considered it advisable to consult me concerning them. Late on the same evening he returned, and stated that the cow first affected was much worse, and that two others had evinced similar symptoms.

Upon the following morning I attended, and found the first cow that was affected dead, and three others ill. A report had been spread, much alarming the neighbourhood, that it was pleuro-pneumonia.

The symptoms were quickened respiration, cough with occasional grunting, increased temperature, extremities cold, muzzle dry, urine sufficient in quantity, but of a very high colour. Bowels constipated, the evacuations being of a darker colour than natural. Percussion, resonance, very dull over the inferior and middle region of the right lung. Auscultation, bronchial murmur increased. Respiratory murmur diminished over the regions above-named.

These symptoms presented themselves in the three affected animals more or less, except that in one of them the respiratory murmur was absent over a portion of the middle third of the right lung.

I had thought from the description of the cases given to me that I might have to deal with a case of sporadic pleuro-pneumonia; but upon a careful diagnosis I at once dissipated all fear upon that matter by informing the owner before making a "post-mortem" examination that it was not the much dreaded pleuro-pneumonia, nor inflammation of the lungs, as he thought it to be, but that there was specific congestion of the lungs, produced by blood poisoning, from some cause not then known to me.

Whilst the dead cow was being prepared for my post-mortem examination, I proceeded to search the premises for a cause, but found none. I then desired to be shown where the cows had been pastured, and was directed to a meadow of about fourteen or fifteen acres of excellent grass, where they had been for some weeks; and for a change had been removed to another meadow, still more productive of milk; "In fact," said the farmer, "this second meadow is the best piece of turf that we have."

In the first meadow I searched for any herbs of a poisonous nature, but failed to find any which would produce the symptoms described. There was a supply of water, but far from being plentiful, a feeble stream emptying itself into a receptacle built for that purpose, and in which was an accumulation of mud and filth. I pointed out that such water was not only deficient in quantity for ten cows, but was also totally unfit for the animals to drink; and alluded to the consequences that might ensue, not only to the cows, but also to human beings partaking of the butter and milk.

I now proceeded to examine the second meadow where the ten cows had been for nearly the past fortnight, and where the illness commenced.

The herbage appeared to be of a superior kind, and I failed to find anything in it which could affect the cows in the manner described.

The situation was much higher. There was no shade to protect the animals from the then intense heat of the sun.

There was a receptacle for water, as in the other meadow, but which had become a receptacle for filth, consisting of cow-dung, mud, &c., &c., to a depth of several feet, and which had been perpetually mixed together by the cows searching for water, and from which was emanating fœtid gas, bubbling up. The supply, so-called, was a small dribbling stream, said to arise from an old well which had formerly belonged to an old house, the ruins even of which were no longer visible. This water, upon examination microscopically and otherwise, was found to be most filthy.

I next proceeded to make a "post-mortem" examination; and here my diagnosis of blood poisoning was fully confirmed. The heart-auricles and ventricles and all the larger vessels were filled with black blood, as were also the vessels of the lungs and other vessels of the bodies generally. The first and last stomachs, and the intestines more especially, gave proof of blood-poisoning.

The other cows, under proper treatment, ultimately recovered.

*To the Governors and Members of the Royal Agricultural Society of England.*

My Lords and Gentlemen,—It will be remembered that I reported a case of rabies which occurred in a herd of cattle in September, 1885. On July 12th of this year I was requested to see another heifer of the same herd, said to be "unwell." I found the animal in a large meadow, together with several others, some being of the same herd as the animal now affected, the others having been bought from various places.

I found similar symptoms present as in the former cases, except that this animal was far more furious than either of the others. It made perpetual and furious attacks upon its companions—foamed at the mouth, bellowed loudly at intervals, then lying down, would continue roaring, making that very peculiar hoarse noise, which, once heard, can never be forgotten.

I had the poor creature removed to a large shed, when it began violently throwing everything about that came within its reach.

Something being required from the shed, a son of the Emerald Isle, who was assisting with the hay, volunteered to go in after it. Having been duly cautioned, he persisted in going in, at the same time observing, "Och, faith, there is little the matter with the poor cratur, I ain't a bit afeard." He was, however, glad to beat a very hasty retreat, bellowing nearly as loud as the heifer.

She continued much in the same state for some hours, when it was deemed prudent to place a rope over the horns, and confine the animal within proper bounds. I was now able to more closely observe the symptoms. Although apparently not so furious, she would *bite* at various things within her reach, and during one of the exacerbations, when lying down, she got a foot of one of the men into her mouth. The poor fellow, however, escaped with nothing more than a fright, his thick hobnailed boot having protected him.

She died during the night, and a post-mortem examination fully justified the diagnosis.

The medulla oblongata, dura mater, and pia mater, more especially denoted that the attack had been a most violent one, these organs presenting that peculiar appearance so well-known in dogs which have succumbed to severe attacks of rabies.

In my last report I alluded to the spread of rabies being often produced by straying, mongrel-poaching dogs. A case which occurred a few years since may serve to illustrate this.

I was called to attend a flock of ewes and lambs said to be suffering in a most remarkable way.

I pronounced it to be rabies. It was then remembered that, a few weeks previous, some strolling gipsies had been "camping" on the highway near to the sheep, and a dog belonging to them had during the night time severely bitten several of the sheep.

I remain,
My Lords and Gentlemen,
Your obedient servant,
GEO. LEWIS, M.R.C.V.S., Monmouth.

Professor Brown had presented the following report:—

PLEURO-PNEUMONIA.

During the three months ending September 25th of this year, there were 145 fresh outbreaks of this disease in Great Britain, in which 647 cattle were attacked. Of these, nearly half the outbreaks occurred in Scotland, and the number of cattle attacked in Scotland considerably exceeded that in England. During the first nine months of this year this disease has increased in Great Britain. This increase is entirely due to the spreading of the disease in Scotland, twenty counties having already become infected compared with thirteen in 1885. In the counties of Aberdeen and Edinburgh there have been more animals attacked than in any county in England, not excluding the metropolis, in which the disease was at one time more prevalent than in any other part of the country.

SWINE FEVER.

This disease is still very prevalent; indeed, there are only three counties in England from which no returns of the disease have been received—viz., Cumberland, Westmoreland, and Hereford. Only a few counties in Scotland or Wales appear to be infected. During three months ending September 25th 2,300 fresh outbreaks in Great Britain, and 10,280 swine attacked.

No outbreak of foot-and-mouth disease has occurred, but enquiries have been made into reported outbreaks.

The following Orders have been passed:—

1. Animals Order, 1886.
   (which includes the Foreign Animals Order).
2. Anthrax Order.
3. Rabies Order.

The diseases now legislated for are—

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| Cattle plague, | Under the Act, 1878. |
| Pleuro-pneumonia, | |
| Foot-and-mouth, | |
| Sheep-pox, | |
| Sheep-scab, | |
| Glanders, | |
| Farcy, | |
| Swine fever, | By Orders of Council. |
| Anthrax, | |
| Rabies, | |
| Sarcoptic mange, | Shetland Order. |

An outbreak of foot-and-mouth in Norway was reported on October 12th, and an Order of Council was passed prohibiting the landing of animals from that country.

In reply to the PRESIDENT, Professor BROWN stated that no action had been taken since the orders had passed. There was to be, he believed, a meeting of the Privy Council next week, when certain recommendations with regard to pleuro-pneumonia, swine fever, and rabies would be made. As regards the experiments in swine fever, he had only just commenced them. He was unable to get a licence for the purpose, and he might add that it had taken him from the beginning of July till the end of October to obtain it; the consequence was that the proper time for these experiments, when he had ample time at his disposal, had passed, and now that the session of the College had commenced, he could not say how long he would be carrying the experiments on.

Earl SPENCER was glad that a licence had been obtained, as it was an important step in the right direction. There was great ignorance among veterinary inspectors in reference to swine fever, and he was happy to find that experiments were to be conducted, and would doubtless be of practical good.

Professor BROWN stated that the Government seemed equally anxious to have the experiments carried on. In reply to Mr. BOWEN-JONES, he believed that there was a reported outbreak of foot-and-mouth disease in Essex, but there had been many all over the country, and in every case it was found that it was not the disease at all. About thirty to forty were reported, and not a single case was such as to cause real disquietude.

This report having been adopted,

Sir JOHN THOROLD (Chairman) gave notice that he would move, at the next meeting of the Council, for an annual grant of £500, of which sum they recommended that £200 be granted to the Royal Veterinary College, in aid of the further development of cattle pathology.

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## Army Veterinary Department.

*Gazette*, October 26th.

Veterinary-Surgeon William Alfred Crow to be Veterinary-Surgeon, First-Class.

The Executive Council of the Melbourne Mounted Rifles have appointed Grahem Mitchell, F.R.C.V.S., Honorary Veterinary-Surgeon, with the relative rank of Major.

Veterinary-Surgeons First Class Burt and Russell, and Veterinary-Surgeons Barry and Richardson, are under orders for India.

We regret to learn that First-Class Veterinary-Surgeon M. Mitchell is now at M. Pasteur's laboratory in Paris, having been hurriedly sent from India to receive protective inoculation for Hydrophobia.

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## Notes and News.

CONTAGIOUS PLEURO-PNEUMONIA IN THE UNITED STATES.—A telegram from New York states that the Commissioner of Agriculture at Washington has forwarded to the Governors of all the States and Territories a series of rules and regulations for co-operation between the United States Department of Agriculture and the authorities of the several States and Territories

for the suppression and extirpation of Contagious Pleuro-Pneumonia. Upon receiving the consent of the State authorities, the Bureau will make a systematic and determined attempt to stamp out the disease, attacking simultaneously every infected district. It is estimated that in Chicago alone 2,000 head of cattle would have to be destroyed, their value being estimated at 100,000 dollars.

SWINE PLAGUE IN THE UNITED STATES.—This scourge seems to be particularly virulent this year in various localities. A report from Tolono, Illinois, September 13th, says: "The most virulent epidemic of Hog Cholera which ever visited the south-west part of Champaign county is now raging along the Okaw river, and is chiefly confined to Sadorus township. The disease first appeared several days ago, and has rapidly destroyed some of the finest herds of swine in this part of Illinois. It is still working up the west bank of the Okaw and spreading through the country. It is so fatal in its character that scarcely any of the afflicted animals recover, and very few in any infected herd escape attack. The loss so far entailed upon the farmers in the region mentioned is not less than 12,000 dols., and from present indications will exceed 25,000 dols. within a short time. The farms in the path of the plague can secure no protection from it, and dealers refuse to purchase their hogs after the disease has reached the neighbourhood. There is no known cause for this terrible visitation, unless it be the unprecedented drought which has prevailed during the past three months." The *Farmers' Review* says that half the hogs in Adams Co., Illinois, have died of Cholera, and considerable loss has occurred in Fayette and McLean counties. The disease is reported in Johnson, Hamilton and Shelby counties, Iowa, and in Adams, Randolph, and Rush counties, Ind.

HUMANITY.—A hospital for sick animals has been established at Calcutta, and endowed with a fund of six lakhs of rupees, thanks to the efforts of a well-known Jain merchant and banker.

THE COST OF ANIMAL AND STEAM POWER.—A writer in the *Revue Scientifique* affirms that, from a comparison of animal and steam power, the former is the cheaper power in France, whatever may be the case in other countries. In the conversion of chemicals to mechanical energy, 90 per cent. is lost in the machine, against 68 in the animal. M. Sanson, the writer above referred to, finds that the steam horse-power, contrary to what is generally believed, is often materially exceeded by the horse. The cost of traction on the Mount Parnasse-Bastille line of railway he found to be for each car daily 57 fr., while the same work done by the horse cost only 47 fr.; and he believes that for moderate powers the conversion of chemical into mechanical energy is more economically effected through animals than through steam-engines.

VETERINARY HONOURS.—It will afford much satisfaction to the members of our profession to learn that, on October 9th, Mr. H. L. Simpson, J.P., F.R.C.V.S., was elected Mayor of the Royal Borough of Windsor. This is a great and a well-deserved honour, as Mr. Simpson stands very high in the estimation of his fellow-townsmen, not only for his professional skill and urbanity, but also for the signal services he has rendered for many years as a town councillor. The honour is all the greater and more distinguished, seeing that this is the jubilee year of Her Most Gracious Majesty, when Royal Windsor is sure to mark the event in a manner becoming its antiquity, its loyalty, and its position beneath the venerable walls of the favourite residence of our Queen. The banquet in the fine old Guildhall of Windsor, in the evening, and at which several members of the veterinary profession were present, afforded ample testimony to the worth of our colleague, and to the manner in which he is certain to carry out his official duties during a very trying year. He looked every inch a Mayor, and acted the part to perfection.

We hope he may be included among those Mayors whom report whispers are to receive special recognition at the hands of her Majesty when she signalises her fiftieth years' reign.

We learn that an old and worthy member of the profession in New South Wales, who has long been settled in that Colony, and who has taken a leading part in its political and social progress, has been raised to the Upper Legislative Chamber, and is therefore now designated the Right Honourable John Stewart. The veterinary surgeons in the old country will, we feel certain, accord him their warmest felicitations, while they hope that he may long be spared to wear his laurels.

Mr. Tait L. Butler, veterinary surgeon, of Chillierthe, Ohio, U.S., a graduate of the Ontario Veterinary College, Toronto, has gained the first prize of fifty dollars, given by the United States Veterinary Medical Association, also the gold medal given by the editor of the *Veterinary Review*, for the best essay on "Parturient Apoplexy."

VETERINARY SCIENCE IN FRANCE.—In France the Minister of Agriculture has issued a commission to make suggestions for the regulation of the practice of Veterinary Science in France.

The suggestions have been accepted, and will probably become law.

They have evidently been copied from the recent law against unqualified practitioners in England. The only differences are:—

1. That in addition to the necessity of having been in practice for five years, the unqualified man, desirous of becoming registered, must undergo a technical examination before a commission appointed by Government.

2. Every veterinary surgeon must be registered in the Prefecture of the Department, and his name must be inserted in the official gazette and registered in his parish.

3. Only French veterinary surgeons are to be employed in judicial or administration cases.

SPRATT'S FOOD.—At the Liverpool International Exhibition, 1886, Spratt's Patent Limited were awarded the Gold Medal for superior excellence in the manufacture of their biscuits, including special mention of the quality of their cabin biscuits.

HORSES FOR WAR PURPOSES.—In 1789, when France was on the eve of a quarter of a century of active hostilities upon an enormous scale, we find that there were 3,250 approved and registered stallions in France, of which three-fifths were the property of Government, and the rest were under its control. These stallions were mated with 115,000 regulation mares, with the result that 55,000 living and perfectly-formed foals were born in 1790. The Government studs were still further developed by Napoleon the Great, as might be expected from the modern Alexander, who, upon the 20th of November, 1812, lost 20,000 horses in his retreat from Moscow during one night of bitter and intense frost. What that night, commemorated by Dr. Arnold in an eloquent passage of his "Modern History Lectures" at Oxford, cost in human and equine life it would indeed be impossible to calculate. But in 1874 an edict was passed ordaining that the number of stallions owned by the French Government should be augmented by 200 annually, until it should reach a total of 2,500 head. Nor is it possible to contemplate this superb body of selected sires without appreciating the wisdom and prescience of the great military nation which, under the first Napoleon, planted its eagles in every European capital, London alone excepted. The same forethought has been shown by Germany and Austria, so that the correspondents of English and American newspapers who passed the winter of 1870-71 at Versailles, to chronicle the events of the Franco-German war, were at a difficulty to find words sufficiently encomiastic to describe the cavalry regiments quartered under the shadow of the barrack-like palace of the Grand Monarque.

UNFAIR COMPETITION.—The desperate straits to which some practitioners are reduced to obtain practice, is well exemplified in the following letter, which has been forwarded to the clients of a member of the profession:—"Messrs. ———. Gentlemen,—As you will see, by enclosed circular, that I have commenced practice on my own account in this district, I beg to offer my professional services, and this at the request of many of your own servants. Having had the bulk of the colliery work to do during my assistantship with Mr. ——— I have had every opportunity for studying colliery practice in all its forms, and am prepared to supply the best of medicine and give every attention *at a lower salary than you are at present paying*. For reference see circular, or apply to any of your servants in this district. I am, yours obediently, etc."

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## Correspondence.

### TIPPING.

SIR,—Mr. Banham seems perplexed that I have not allowed the truth to pass without protest. What truth? I deny that veterinary surgeons as a body give a percentage of their bills to the servants of their clients. The only proof he gives of his offensive accusation is, that such things are being done by West End practitioners, and that he has suffered loss—I presume, at Cambridge—by refusing to consent to such dishonesty. What is being done in the West End I do not pretend to know, but am willing to take it on his testimony, without the somewhat hazardous experiment of removing to that locality. It does seem to me, however, a considerable leap from that premise to the conclusion that we, as a profession throughout the kingdom, are guilty of putting our hands into our clients' pockets to pay the coachmen a specified percentage of our bills. The veterinary surgeon who does that is a dishonest man and a disgrace to his profession. What I cannot understand is that Mr. Banham does not distinguish between giving a groom or any other servant a gratuity and deliberately robbing a client. Does he wish it to be understood that he never, under any circumstances, gives any person a gratuity? The man who, travelling by rail, gives the porter sixpence for attending to his luggage may be a dishonest man, but giving the servant of the company a gratuity does not make him one, nor by so doing does he rob the shareholders, which ought to follow according to Mr. Banham's reasoning.

Mr. Banham thinks, and I agree with him, that the servants of our clients ought to carry out our instructions as nurses do for human practitioners (by the way, does he know that doctors give nurses gratuities?). So they ought, and so they do after a fashion. In a case of difficult parturition, has not Mr. Banham found the difference between cheerful and reluctant help? Many a time have I felt extremely grateful for ready assistance in these cases, which tax not only one's skill and ingenuity, but physical endurance. In these and similar instances I always acknowledge my obligation, nor do I see that by so doing I have insulted my client (which surely would have been evident by this time!), made the servant less worthy of his situation, or disgraced my profession. Your correspondent allows that it is strange I have never been asked what percentage I gave, and kindly offers four probable explanations, carefully avoiding the right one, for my consideration, which will or may account for, to him, so singular an experience. 1. I have had a forge for eight or nine years, but derived from it no confirmation of his charges against the profession. 2. This is not an explanation one gentleman would offer of another's experience, therefore I will not

"consider" it. 3. From my observation grooms have a very uniform type of character, wherever they are found. In an article which appeared in one of our evening papers not many weeks ago "On Hats," which provoked several interesting letters, it was stated on good authority that, if the size of head is any indication of intellectual capacity, stablemen are in the lowest rank. From my knowledge of them they are as low morally as intellectually. 4. I may have been fortunate in escaping infected districts, but was not aware of my indebtedness to a kindly providence; I am none the less grateful. In reply to Mr. Santy, I will content myself by saying that if "we are all honourable" we cannot be guilty of dishonourable conduct. I am sorry Messrs. Banham and Santy have lost clients through their loyalty to principle, but both will rise in the estimation of honest men in consequence.

Progress, even to the highest pinnacle of fame, is possible by the basest methods in commerce, society, art, and even literature. There is but one road to moral distinction—self-sacrifice. I thank you for kindly placing so much space at my disposal.

J. FRASER.

## FARRIERY IN THE INDIAN ARMY.

SIR,—In the July number of the JOURNAL, which I have just received, there is a communication from Veterinary-Surgeon Marriott, A.V.D., in which he comments severely on the shoeing of the Bengal Cavalry. In many instances the shoeing of the Bengal regiments is anything but what it should be, but I have seen regiments, both in Bombay and Bengal, whose shoeing left but little to be desired. I write this in justice to officers of these services, who have taken much pains to have their regiments well shod.

Hamadhan, Persia, *Sept.* 27th. G. J. R. RAYMENT, A.V.D.

## THE RELATION OF ACTINOMYKOSIS TO MADURA FOOT.

SIR,—May I be permitted to ask a few questions on the above subject, through your valuable JOURNAL? First, what is Madura Foot? It is due to a fungus which is identical with the ray fungus met with in the disease known to us as Actinomykosis, or Rivolta's Disease—a disease formerly confounded with sarcoma and scirrhus of the cord, etc.

In a recent examination of a case of chronic disease of the lower jaw in the elephant, which I found to be Actinomykosis of many years' standing, I have noted that the actinomyces, examined under a low power, "cannot be distinguished from the fungus found in specimens of Madura Foot of the human subject." Is it possible that the two diseases are alike? In my work on Veterinary Surgical Pathology, published this year, I have given a sketch of some of the appearances presented by the actinomyces from the lower jaw of the elephant, and it is to the fungus magnified only 20 diameters that I wish particularly to draw attention. R. W. BURKE, V.S., A.V.D.

Cawnpore, 28th *Sept.*, 1886.

## VETERINARY SURGEONS IN THE YEOMANRY.

SIR,—It is rumoured that in some yeomanry regiments members of the Royal College of Veterinary Surgeons accept the rank of Sergeant Farrier. If this be a fact, it may well be asked whether such regiments boast of a veterinary surgeon, holding a commission such as obtains in the mounted branches of the regular army? and, if not, whether there is not some loss of dignity in a qualified professional man being content with the non-commissioned rank? Perhaps some of our yeomanry friends would be kind enough to throw some light on this subject in the VETERINARY JOURNAL?

*October 16th*, 1886. "OBSERVER."

## DUPLICATE ORIGINAL COMMUNICATIONS.

SIR,—I have seen the note in the November issue of the VETERINARY JOURNAL, complaining of the news in the JOURNAL and *Veterinarian* being so much alike. I have frequently noticed the same, and all readers of the two journals must have seen it also. As a remedy, I would suggest that you, being the *junior*, or one of you, should alter the date of publication to the 15th of the month, it would be a great boon to the readers, and, I believe, no worse for either publication. A month between the date of issue in these days of *Daily News*, etc., is a long time, and leaves your readers in the dark as to what is going on in the veterinary world. As an example, at the time of your discovery of Actinomycosis, we heard of it in the daily papers some fourteen days before getting the Journal, leaving your readers, who, I think, ought to have heard of it first, considerably in the dark. Yours truly,

W. J. ARKCOLL, V.S.

[This alteration in the date of issue would not remedy the complaint referred to, which it remains for correspondents to obviate, as has been already intimated.—ED. V.J.]

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OWING to the very extensive report of the proceedings of the Border Counties Veterinary Medical Association, and the late date of receipt, we are compelled to defer its publication until next month. Other communications received are also held over for our next issue.

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## Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from "Observer"; G. J. R. Rayment, A.V.D., Persia; R. W. Burke, A.V.D., Cawnpore; J. S. Hurndall, Liverpool; C. H. Huish, London; T. Bowhill, Lincoln, Nebraska, U.S.A.; J. Cameron, Berwick-on-Tweed; Max Kettritz, Gnesen; F. Raymond, A.V.D., Woolwich; Professor A. Smith, Toronto; J. Freeman, Hull; J. Fraser, Bromley; H. F. James, St. Louis, U.S.A.; W. J. Arkcoll, Leek; Messrs. W. Cooper, Berkhampstead; J. A. Smith, Calcutta; Professor McCall, Glasgow; W. Broughton, Leeds; C. Cunningham, Slateford; Professor Walley, Edinburgh; J. Harrison, Warcop; D. C. Pallin, A.V.D., Dorchester; J. A. Nunn, A.V.D., London.

BOOKS AND PAMPHLETS: *E. Courtenay*, The Practice of Veterinary Medicine and Surgery; *L. Brusasco*, Antiparassitici, Antectoparassitici ed Antelmintici; Grave Idroperitoneo in Una Cavalla; *R. Leuckart and W. E. Hoyle*, The Parasites of Man; *G. C. and A. Gresswell*, The Veterinary Pharmacopœia, Materia, and Therapeutics; Proces-Verbal de la Academie Royale de Médecine; Bulletin de Comité Consultatif pour les Affaires Relatives aux Epizooties, etc., de la Royaume de Belgique; *J. Mills*, Manual of the More Deadly Forms of Cattle Disease in India; Report of the Third Annual Meeting of the United States National Veterinary Medical Association.

JOURNALS, ETC.: *Repertorium der Thierheilkunde; Recueil de Méd. Vétérinaire; Vaccination Inquirer; Deutsche Zeitschrift für Thiermedicin; Annales de Méd. Vétérinaire; Journal of National Agricultural Society of Victoria; Wochenschrift für Thierheilkunde und Viehzucht; Der Hufschmied; La Clinica Veterinaria; Revue Vétérinaire; American Live Stock Journal; Lancet; Journal de Méd. Vétérinaire; Echo Vétérinaire; Live Stock Journal; Mark Lane Express; London Medical Record; Edinburgh Medical Journal; Outing; Practitioner; Midland Medical Journal.*

NEWSPAPERS: *Baltimore Sun; Daily Nebraska State Journal; Toronto Globe; Marlborough Times.*